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The Protection of Trade Marks

HOWEVER good a product may be it cannot sell itself; there has to be a sales organisation behind it. Obviously one of the main functions of the sales organisation is to make the product well known to the buying public through channels such as advertising. An asset of incalculable value in this work is a distinctive and easily-remembered name for the brand of goods manufactured. A name with these properties may well be carried in the mind of the prospective buyer even before the thought of purchase has occurred to him and thus psychologically assists any subsequent sale. And once having made a purchase and finding the goods satisfactory, the placing of further orders will be materially assisted if the name of the brand is so distinctive and easily remembered that it is instinctively singled out. A good trade mark is, therefore, a valuable possession and its protection is a matter of importance to industry.

In a recent lecture before the Institute of the Plastics Industry, Mr. N. H. Buckley outlined the principal requirements of a trade mark to be registrable, and made some useful personal suggestions on the choice of the trade mark itself. The greatest care should be taken in adopting a mark, because changing entails loss of benefits obtained through the use and advertising of the mark and because it is very necessary to have a mark which will not be contrary to any of the provisions of the Trade Marks Act. Descriptiveness should be avoided. Preferably the word should be short, thus easier to remember, and it is desirable that anyone hearing the word will be able to spell it in the same way as the owner of the trade mark. There should be only one way of pronouncing the word, and the pronunciation should be obvious from the spelling. This greatly helps the trade mark to be easily remembered. If export trade is carried on under a trade mark, it is desirable that the word should be capable of pronunciation in any of the countries where the goods are sent. Where extensive advertising is contemplated it is advantageous to link up a word mark with a device mark. This is not easy, of course, in the case of an invented word, but by advertisements employing the word and device together it is possible to create a strong connection between the two in the minds of purchasers.

A point which has often proved to be a stumbling-block in the life of a trade mark is where the trade mark becomes to be used as the name of the article itself rather than that of a particular brand of the product concerned. In such circumstances the trade mark is liable to be held invalid. Mr. Buckley pointed out that the 1937 Act had improved matters in this respcet, since it provides that a registered trade mark shall not be regarded as invalid because of the use, after the date of registration of the registered word as the name of an article or substance, except in three cases. The first is where there has been a well-known and established use by other traders of the mark on their own goods. The second is where the article or substance has been manufactured under a patent. If two years after the patent has ceased to be in force the only practicable name or description for the article or substance is the trade mark, it is liable to be removed from the register. The third exception is that any word which is the commonly used and accepted name of a chemical element or compound, as distinct from a mixture, if registered is liable to be removed from the register. It is clear from the provisions of the Act that where there is a tendency for the registered trade mark to be used as the name of the article, it should be seen that any such infringement is stopped at once.

Where a registered trade mark is adopted in the case of a patented article, a practicable name or description must be given to it an appreciable time before the interval of two years since the patent ceased to be in force. Mr. Buckley gave an example which made these matters clear. Assuming that a chemical manufacturer develops a process, which is patented, for the manufacture of phenylisocrotonic acid and he desires to sell under a trade mark for which " Phenic " is suggested. It is most likely that " Phenic " will be used as the name of the substance rather than to indicate his particular make. In a case like this, the word " Phenic " should be dedicated to the public and another trade mark, say, " Crotofeen," should be found and the combination used somewhat as follows: " Crotofeen Brand " of phenic acid (phenylisocrotonic acid). Putting aside the question of patents, other traders could sell phenylisocrotonic acid as phenic acid and the manufacturer in question would reserve to himself the right to the word " Crotofeen." Even if others could not make phenic acid to compete with him during the existence of the patent, a practicable name is provided for use if they wish to take up manufacture after the patent expires, and the monopoly of the word " Crotofeen " is retained.

Other important departures made in the 1937 act and described in the paper were that registered trade marks are now allowed to be assigned with or without the goodwill of a business and for all, or only part of, the goods for which it has been registered; that trade mark owners can authorise others to use the mark; and that " defensive trade marks " can now be registered. Mr. Buckley's paper gave a very good idea of the value of a trade mark and the trouble which should be taken in its invention and maintenance. It is almost essential to the sale of most products.

Notes and Comments

The Indian Science Congress

THE Jubilee session of the Indian Science Congress, held jointly with the British Association, was opened on Monday by Lord Linlithgow. In the twenty-five years of its life, the Indian Association has seen a remarkable expansion of scientific endeavour in India, comparable to the phenomenal achievements made in this country since the opening of the present century. Lord Linlithgow expressed the hope that the British Association would be a channel through which India would make, in increasing degree, full contribution to western and to world thought. The inaugural address prepared by the late Lord Rutherford, and read by Sir James Jeans, is abstracted on another page. It contained an account of the organisation of research in Britain through Government aid and by means of co-operative research associations. The suggestion was made that for a country like India research organisation should be on national rather than provincial lines.

Steel Trade's Record Year

ACCORDING to a review issued by the British Iron and Steel Federation, the trade has never experienced a more successful year than that which has just passed. The output of steel ingots and castings was 12,900,000 tons, an increase of 3 million tons in the last two years, compared with 9,600,000 tons in 1929. This increased output was accomplished by an estimated expenditure of 20 million pounds in new and reconstructed plant during the past two years (nearly nine time as much as that spent in 1929). But the industry's programme of re-equipment is not yet complete, it is estimated that a further expenditure of over 10 million pounds will be involved in 1938. This will enlarge the steel making capacity at the end of the year to rather more than 14 million tons per annum, as against approximately 11 million tons at the end of 1929. The statement that the steel industry enters upon 1938 at a record rate of output in the hope of reducing undelivered orders to more normal proportions, summarises a position of which any branch of industry would be justly proud.

Smoke Abatement

CHEMICAL manufacturing processes must necessarily give rise to the formation of by-products and waste materials, some of which can be turned to account and others which not only serve no useful purpose but are more or less harmful. Coal smoke, and air pollution generally, come into this latter category. The National Smoke Abatement Society was formed in 1929 to prevent air pollution by creating an informed public opinion on the evils of this pollution, assisting investigation directed towards the abolition of smoke, both industrial and domestic; popularising the use of smokeless methods of heat and power production; and promoting and supporting legislation for preventing the pollution of the atmosphere. The annual report of the Society for the year ended June 30 last gives an account of the progress made in this valuable work. The most important event of the Society's year was the Smoke Abatement Exhibition held at the Science Museum during October, the exhibits shown being divided into three main sections: (1) Smoke and its effects, (2) the measurement of smoke and pollution, and (3) methods for the abatement of smoke. At the annual conference held during the course of the exhibition a resolution was passed to the effect that where public money is expended upon the purchase of plant for the combustion of fuels, the plant should be smokeless in operation. The application of smokeless fuels for industrial and domestic purposes would have an enormous effect in the reduction of atmospheric pollution.

Symposium on Vitamins

THE extraordinary complexity of the role which vitamins play in nutrition and the difficulties associated with the determination of their precise function were well brought out at a symposium on vitamins held by the American Chemical Society last month. In a paper on riboflavine (vitamin G), Dr. H. C. Sherman described experiments, which had been conducted over a period of five years at Columbia University, for determining the optimal intake of riboflavine. It was found that a level of intake of about 1.5 micrograms of riboflavine per gram of food solids suffice to prevent any sign of specific nutritional deficiency and to support normal growth and reproduction. Successive increases in the riboflavine content of the food result in successive improvements in nutritional well-being up to about three times the minimal adequate level, while offspring appear to show increasing benefit to even higher levels. These results bring about a marked modification of the long-established views of Liebig and Bernard who held the idea of fixity in the chemical composition and internal invironment of each species.

The Function of Thiamine

SUMMARISING experimental work on thiamine (vitamin B1), Dr. R. R. Williams said that it had become clear that thiamine in the form of its pyrophosphate acts as a coenzyme and enzymes which involve thiamine have to do with the utilisation of starches and sugars for the production of energy or for tissue synthesis. It is, therefore, concerned with the most elemental function of living matter. Among other papers presented at the symposium, one by Dr. K. C. D. Hickman on the so-called molecular distillation is worth special mention. Molecular distillation, done in a high vacuum short-path still, is utilised to produce vitamin A concentrates on a large scale. Vitamin chemistry, in its relation to the processes of the human body, is practically in its infancy, but the researches so far carried out show what immensely valuable results may be expected in the future.

The Supply of Oil

IN considering the sources of supply of nationally indispensible materials which might be affected by the emergency of war, the fact that the very great majority of the country's oil requirements is met by supply from countries outside the Empire has naturally come into prominence. Accordingly, alternative sources of production, such as that from coal, have been widely discussed recently and the various methods of production investigated by the Government. In a letter published on page 28, Col. W. A. Bristow, chairman and managing director of Low Temperature Carbonisation, Ltd., states that a campaign is being waged against the coal oil industry on the grounds that it is uneconomic, and it has been said that for every gallon of petrol produced in England the Treasury loses the value of the 8d. tax. Col. Bristow sets out the reasons why this suggestion is false and presents facts which show the desirability of urging the Government to take active steps in securing a liquid fuel producing industry in this country.

Exhibition of Scientific Instruments and Apparatus

New Exhibits of Interest to the Chemical Trade

THE 28th annual exhibition of Scientific Instruments and Apparatus, organised by the Physical Society, was held at the Imperial College of Science and Technology, South Kensington, London, S.W.7, on Tuesday and the two following days. Eighty-four firms exhibited in the trade section, and there were twenty-six contributors to the research and educational section. Descriptions of instruments exhibited for the first time are given below.

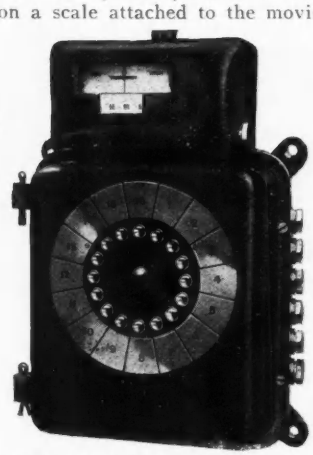
The Dexrae industrial X-ray unit (Adam Hilger, Ltd.) is a mobile, shock-free X-ray spectographic and crystallographic unit complete with demountable, multi-target, hot cathode X-ray tube, transformer, pumps and camera equipment, for the study of the metallurgical conditions of metals and alloys. It may be used for investigating such conditions as cold work, preferred orientation, etc., and can be applied to any type of object including many structures in situ. The whole of this equipment has been compactly assembled upon a trolley in such a way that it may be wheeled from place to place and used anywhere as long as connection with a water supply, for cooling the tube, and alternating current can be maintained. A central feature of this unit is the specially designed X-ray tube which, with the sole exception of the insulating porcelain support of the cathode, is entirely built in metal.

A New Microscope

The Ultraphot (Carl Zeiss (London), Ltd.) is a universal instrument of compact design which can be quickly arranged for any desired method of investigation and for high or low power. The instrument can be arranged for binocular or monocular observation and for transmitted or incident light with dark or bright field and polarised light.

In conjunction with the mercury vapour lamp and mounted on an optical bench, the Pulfrich photometer (Carl Zeiss) can be used for the colorimetric determination of silicon in steel. For the simultaneous observation of two absorption spectra using only a single source of light, a hand spectroscope with test-tube condenser is now obtainable.

A balanced-bridge resistance thermometer (Elliott Bros. (London), Ltd.) has been specially produced to meet the requirements of refrigerated food-carrying vessels, where accurate temperature measurements are required under conditions unfavourable to the usual direct deflection arrangement. The resistance thermometer has three leads, so that the lead resistance is automatically compensated when the bridge is balanced by the 17 in. slide wire. The temperature is read on a scale attached to the moving contact, the latter being in the galvanometer circuit so that its resistance is immaterial. A sensitive and robust galvanometer of modern design is incorporated, together with a selector switch of the press-button pattern for any number of ways up to 45. The advantages of the system include independence of line resistance and battery voltage, and use of the galvanometer as a null point detector only. The principle is the same as that adopted by the Food Investigation Board for experimental purposes.



Balanced bridge type temperature indicator made by Elliott Bros. (London) Ltd.

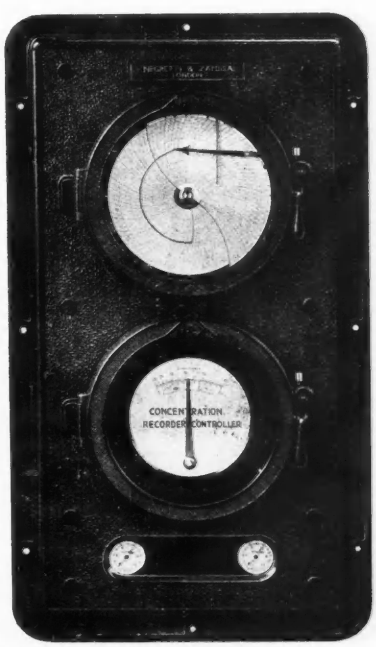
New balances (L. Oertling, Ltd.) include a prismatic reflecting microchemical balance, capacity 10 g., sensitivity 0.001 mg.; and a prismatic reflecting microchemical balance with protected beam and rider bar in line with knife edges.

A concentration recorder controller (Negretti and Zambra) has been specifically designed to provide a large open scale for small differences in condition, and consequently high accuracy, so as to provide automatic control where hitherto it has been assumed impracticable owing to the fine limits required. The field of application is wide, as the instrument may be used in all cases where the actuating pressure available for operation is extremely small. The instrument particularly lends itself to adoption in such processes as the control of the concentration of wood or pulp in paper-board manufacture, also for explosives processing, control of specific gravity of a solution or ratio of ingredients.

Time-Cycle Process Controller

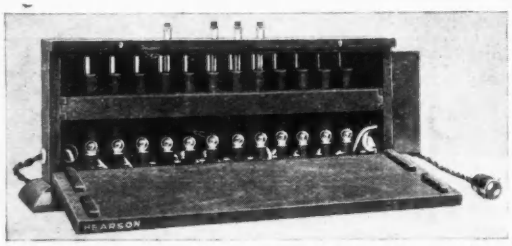
The thyratron valve operated time-cycle process controller (Negretti and Zambra) is designed for use with any established controller such as a potentiometer pyrometer controller, flowmeter, etc., and is added when a fully automatic time-cycle process control is required for control of temperature, pressure, flow or other physical condition. In certain large-scale process operations where economy in operation is a factor of importance, and the saving in labour and fuel costs more than offset the initial cost of an instrument, an automatic time-cycle process controller has the added advantages of ensuring a consistently high grade of product, ability to run precisely to a predetermined economy schedule or chart, and the elimination of the human element or " hit and miss " guessing of an operator.

" Tensovic " (Metropolitan-Vickers Electrical Co., Ltd.) is an impregnated wood material. It possesses a remarkably high tensile strength, an average figure of 30,000 lb. per sq. in. being obtainable. Although it is possible to turn up this substance in a wood-worker's lathe, it is much harder than untreated wood, the precise degree of hardness depending on the particular timber selected. The surface, moreover, is capable of withstanding a considerable amount of abrasion. " Tensovic " will withstand long immersion in water and show no deformation, or distortion. In thin sheet form it is flexible and can be bent round a moderate radius, but it cannot be bent at right angles or moulded into any special form. Uses are being found in a number of different fields where a wood material of greater strength than that of natural wood is required.



The Negretti and Zambra concentration recorder controller.

A new *p*H meter (Marconi-Ekco Instruments, Ltd.)



Precipitation reaction viewing apparatus manufactured by Charles Hearson and Co., Ltd.

comprise a glass electrode cell, chain connected to an electron coupled galvanometer mounted integrally with a precision type potentiometer. The glass electrode is of the sealed silver-silver chloride type with a saturated calomel reference. The electron amplifier is a true impulse type, the controls being calibrated in mV and *p*H values over a range of 1 mV to 1.5 V, and 0.01 to 15 *p*H respectively.

Precipitation Reaction Viewing Apparatus

An improved precipitation reaction viewing apparatus (Charles Hearson and Co.) has been designed for the detection of flocculation and examination for the presence of or for the comparison of any opacities or precipitates in any fluid at room temperature.

A new light-sensitive switch (Venner Time Switches, Ltd.) is based on a photochemical reaction long known to chemists. If a glass container filled with equal volumes of hydrogen and chlorine gas be exposed to sunlight the two gases combine instantly. If the light is subdued the rate of combination is slower, and in darkness the two gases do not combine. This reaction is used as the basis for the action of the relay. A small glass bulb with two electrodes sealed into it is partly filled with a solution of calcium chloride and hydrochloric acid. Electrolysis of the solution takes place, hydrogen and chlorine gases being produced within the glass bulb, and if this bulb is in darkness the two gases do not combine and a gas pressure is built up. One side of this bulb consists of a thin flexible diaphragm which bends slightly with increasing gas pressure. This bending motion either operates a direct-acting switch or moves a mercury column and closes the circuit which the device controls. After the switch has closed a large resistance is put in series with the electrodes to prevent any further gas pressure being built up. When the glass bulb containing the two gases is exposed to light of a certain intensity the gases recombine, dissolve in the solution and the pressure is reduced. The glass diaphragm returns to normal and the circuit is broken.

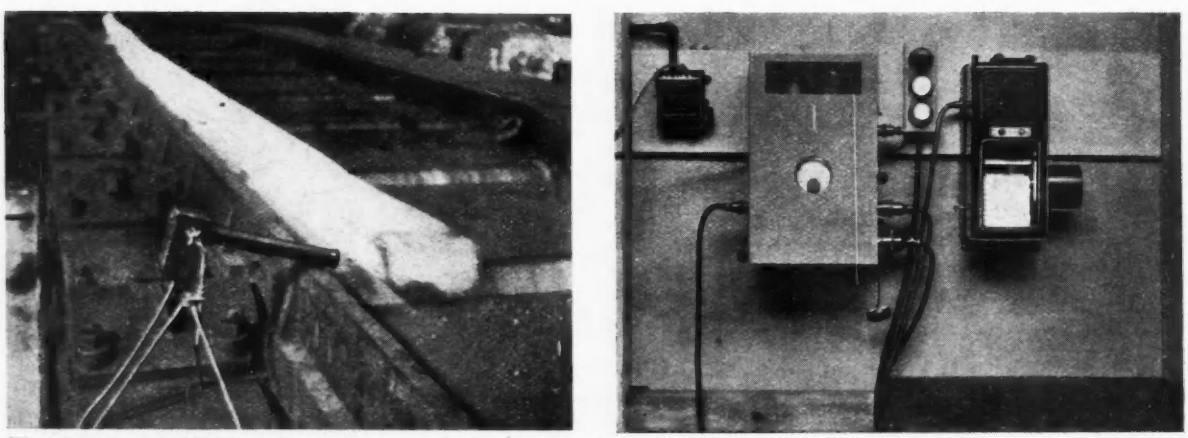
The Foster photoelectric high-speed recording pyrometer (Foster Instrument Co., Ltd.) is a high-speed precision instrument for indicating and recording temperatures in excess of 800° C.; it has been designed primarily for use on rolling mills, and similar applications necessitating the accurate recording of the temperature of moving objects such as ingots, billets, rails, etc. The apparatus comprises three compact assemblies, the transmitter, amplifier and recorder, but additional indicators, recorders, signal lamps and contactors or relays may be included either for full automatic signalling or automatic control. The circuit response is instantaneous, and the apparatus is so arranged that a full-scale deflection is obtained in approximately 1 sec. so that the temperature of any hot object which presents itself to the field of view for this time can be measured and recorded.

In connection with new electrical resistance thermometers for temperatures up to 1,000° C. (Sun-Vic Controls, Ltd.), it is pointed out that difficulties have been experienced in the past in producing resistance thermometers for temperatures exceeding 500° C., and for this reason controllers working above this temperature have been designed mainly for operation from thermocouples. Resistance thermometer operation, however, is greatly to be desired since the relay torque derived from the current in a resistance thermometer may be about one thousand times that from a thermocouple. Mechanically, however, a resistance thermometer for operating over 500° C. involves difficulties in supporting the platinum coil so that it is not subjected to temperature stresses on heating or cooling. Also for rapid response the thermal conductivity through the protective sheath to the platinum coil must be good, and the thermal capacity of the thermometer element must be low. From the point of view of corrosion the materials of the thermometer must be such as will not injure platinum at high temperatures and, in addition, the platinum must be effectively protected against the ingress of injurious gases, metallic vapours, etc.

Thermostat for Accurate Laboratory Work

An adjustable thermostat with sensitivity of 0.1° C. (Sun-Vic Controls) has been developed to meet the need for a robust and easily adjustable instrument for accurate laboratory work, for which in the past only mercury or mercury-toluene regulators have been suitable. The thermostat is similar in construction to those previously shown but has a bimetal actuating helix 6.25 in. long, from which it derives its greater sensitivity. The range of adjustment of this instrument is ± 10° C. and it may be set for temperatures up to 150° C. The instrument is designed to operate with a hot-wire vacuum switch.

Two points of great practical use have now been embodied in the improved aperiodic balance (Baird and Tatlock (London), Ltd.). The air-damping system, which renders the



The photoelectric high-speed recording pyrometer made by the Foster Instrument Co. Ltd. On the left, the receiving tube is actually measuring the temperature of the billet, which is seen passing along, and on the right is the remainder of the apparatus.

balance practically dead beat, can at a moment's notice be altered so that the beam swings much more freely, and the pans are prevented from swinging when the load is eccentrically placed.

The B.T.L. "Gyro" centrifuge (Baird and Tatlock), designed by Dr. Fuchs, has a speed of 7,000 r.p.m. and a total load of 500 ml.; the r.c.f. is 8,300 times gravity; a universal ¼ h.p. motor, 230 V. A.C./D.C., maximum 3.5 amp. is used; the speed control resistance has an "off" position consisting of an automatically operated switch.

A modification of the Haldane gas analysis apparatus (Baird and Tatlock) makes it possible to bubble gas through the absorption fluid both when the gas is forced through it under pressure, and when it is sucked back again, thus increasing the speed of absorption. The pipettes are easily removed, and cleaning difficulties are avoided; glass beakers complete this part of the apparatus. The fluid is covered by a thin layer of paraffin oil, and contamination by the atmosphere is therefore prevented. Mercury is replaced by a saturated solution of sodium sulphate and sodium chloride rendered slightly acid with sulphuric acid and coloured with methyl red; this liquid does not dissolve any appreciable amount of gas. The levelling bulb is moved up and down in an arc and remains in any position in which it is set. The apparatus may be used with or without gas between stopcock and absorption pipettes.

Clark and Hodsman Viscometer

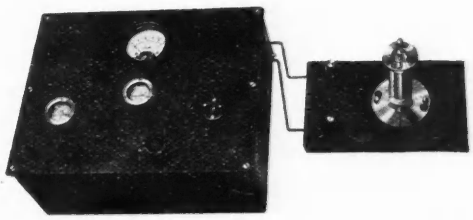
A new Clark and Hodsman viscometer (A. Gallenkamp and Co., Ltd.) has been designed for determination of viscosity and thixotropy of viscous materials, which are beyond the limit of the Technico instrument, and has been found to give easily reproducible results. A new Miller Jones gas calorimeter for the determination of calorific values of fuel gases to a considerable degree of accuracy on samples of only 350 ml.; a photoelectric turbidimeter for the determination of particle size and settling rates of various finely divided materials such as cement, etc., by means of a photo-cell; and an improved photoelectric colorimeter are also exhibited.

In the Finch electron diffraction camera (W. Edwards and Co.) the diffraction pattern afforded by the specimen is visually observed upon a fluorescent screen which is rotated in order to record the pattern by a direct impact of the electrons upon a photographic plate.

For certain classes of chemical work vacuum pumps are required for the purpose of reducing the pressure to a few mm. only in receivers in which chemical decompositions, distillations, drying, etc., take place. Under these conditions deterioration rapidly takes place in all ordinary pumps, due to the condensation of water vapour or corrosive vapours. To avoid these difficulties, the Gaede heated pump (W. Edwards) has been designed to overcome condensation of volatile organic vapours; the gas ballast pump is for use when corrosive vapours are being exhausted.

The "Elmometer" (Kipp en Zonen, Holland, and W. Edwards) is used for determining in a quick and easy manner the humidity of materials such as tea, tobacco, flour, grain, paper, artificial silk, cotton, wool, butter, oil, etc. The apparatus consists of an electrical measuring instrument together with a measuring cell or condenser, for containing the material to be investigated, and works directly from A.C. supply mains. The adjustment of the apparatus varies according to the humidity of the test material, and once the relation between these two is known moisture content can be immediately deduced from adjustment. The relation is most simply expressed by means of a calibration curve, which can easily be plotted by testing in the apparatus samples of known moisture content as measured by the usual method. Each material will require its own calibration curve.

The Goodeve thixoviscometer (Griffin and Tatlock, Ltd.) makes possible the measurement of thixotropy and other anomalous viscosity effects in absolute units. As in the Couette type of viscometer the rotation of an outer vessel



The "Elmometer" made by W. Edwards and Co.

produces on a coaxially suspended body a torque depending upon the resistance to flow of the contained liquid. By making the outer vessel and the suspended body in the shape of cones, it is possible to adjust the rate of shear to any value over a wide range. The range is further increased by a factor of 100 by the use of gears to change the rotational velocity. The apparent viscosity of most colloidal solutions decreases as the shear is increased, and builds up again when the solution is allowed to stand. When such solutions are placed in this instrument a steady state is rapidly set up, and the readings over a range of shear can be taken in a short time. The instrument exhibited covers the range from 0.01 to about 100 poises, that is from dilute aqueous solutions up to paints and thin printing inks.

A saccharimeter for use with sodium light (Bellingham and Stanley, Ltd.) has an electric sodium lamp which gives monochromatic light of sufficient brilliancy to dispense with the usual quartz wedge compensation system. A glass circle and vernier are provided, the sugar scale being etched indelibly on the glass. The optical system is so arranged that the observer is parallel to the length of the instrument, and the matching point and the scale reading are visible in a hood, neither telescope nor magnifier being provided.

A recording ratio flow controller (George Kent, Ltd.) is intended either for blending different gases in any desired ratio or for proportioning gas and air for best combustion conditions.

New High Temperature Tube Furnace

A new high temperature tube furnace for research work (R. M. Catterson-Smith) attains a temperature of 1,400° C., and is housed in small-mass refractory, backed by heat insulation. In the construction of this furnace special care was taken to eliminate magnetic materials, and the heater tube, connecting endbands, casing and framework are all made of non-magnetic material.

A "Fulscope" controller of indicating type (Short and Mason, Ltd.) is complete with humidity and temperature elements from top of case, aspiration on humidity side and sensitive type bulb on temperature side.

A colorimeter of the Duboscq type with easy to read scale magnifiers (Bausch and Lomb Optical Co., Ltd.) will be appreciated for its simple manipulation.

New refractory equipment (Activation Crucible and Muffle Co.) includes a refractory poker for all types of gaseous reduction and oxidation in chemical and metallurgical firing processes, a compartment crucible for standard furnaces for testing purposes, roasting trays for spade lifting from furnaces, and crucibles, muffles, dishes, etc., made of alumina, mullite, and silicon carbide for flame impact.

Schwaiger's low temperature viscometer (International Technical Developments, Ltd.) enables the viscosity of lubricating oils to be measured quickly, cheaply and accurately within a temperature range of + 20° to − 20° C. This method reproduces as far as possible the conditions in which lubricating oil normally performs its function in the cylinders of an internal combustion engine. When not used as a viscometer, this device makes an excellent general laboratory refrigerator. Extra low temperature refrigerators to give temperatures as low as − 65° C. which can be held constant over any period of time have the aid of a two-cycle system, the first using methyl chloride as a refrigerant and the second liquid propane.

Letters to the Editor

Oil in War-time

SIR,—In the growing concern with which public men of all parties are again regarding the question of the supply of oil in war-time, none of them denies that our three defence forces are now dependent upon liquid fuel for their power to function.

We have witnessed during the past few years the birth of a new industry, namely, the conversion of coal into oil by various processes. It is a matter of common knowledge that many countries are fostering this new industry and we also know that Germany in particular has embarked upon a programme of a magnitude calculated to make her entirely independent of foreign petroleum within a period of four years.

In this country, however, a campaign is being waged against the coal oil industry on the grounds that it is non-economic and it has been stated that for every gallon of petrol produced in England the Treasury loses the value of the 8d. tax. A moment's consideration, however, will show the absurdity of this suggestion. In the first place, it must be recognised that imported oil by itself pays nothing in duty. The money paid to the Exchequer is derived from the whole community and oil is merely one of the levers by which the Chancellor of the Exchequer extracts from our pockets every year the amount necessary to run the country.

If revenue were not derived from oil it would be raised on some other commodity or taxable basis. A parallel case is presented by the automobile industry which is protected by a duty of 33⅓ per cent. on imported motor cars, from which duty home-produced vehicles are exempt. According to the critics of the coal oil industry each of these motor cars made at home occasions the revenue a heavy loss, and therefore the industry must be non-economic and the manufacture of motor cars in this country commercially unsound.

It is clearly wrong, therefore, to confine consideration of the problem merely to the case of the individual in his capacity as a buyer of fuel. Instead of paying 8d. in one sum to the Government for every gallon of oil purchased, his 8d. has already been expended by giving employment in many industries and he has, as an ordinary member of the community, already been benefited thereby.

In the motoring papers each week may be observed the familiar advertisement "Buy British," but whenever we try to apply this same slogan to British oil, the industry is assailed on the grounds that it is non-economic, the sole charge being that the home-made liquid, as with the motor car, does not pay duty.

It is customary also for the exponents of foreign oil to extol the advantages which this country obtains in supplying steel and other materials for the construction of refineries, ships, etc., utilised in the production and transportation of foreign petroleum. It is perfectly true to say that the industries of this country are thereby benefited to some extent, but it is equally clear that these benefits would be increased a hundredfold if the oil were produced at home.

Recently the Government have granted licences to prospectors to drill for petroleum oil in this country and operations are already in progress. According to the critics the first gush of natural oil from British soil will be a national calamity of the first order. The Treasury, according to them, will lose a vast sum of money. The oil tanker industry will be ruined and all sorts of other fantastic objections will be raised. Presumably, therefore, the spouting hole must be immediately plugged and the disgraceful episode kept as secret as possible.

It is an unfortunate fact that of the total production of natural petroleum, less than 5 per cent. is found within the British Empire. It is certainly true that British companies control over 20 per cent. of the world's supplies, but financial control should not be confused with physical control, and the danger of relying upon the former was amply demonstrated by the negotiations for oil concessions which were reopened in Persia only two years ago. It would seem desirable, therefore, that the Government shoud take steps to promote and encourage the production of liquid fuel in this country.

Great Britain and the Empire have been made by coal and their future and their fortune are to-day more vitally linked up with our coal resources than ever before in our history.—Yours faithfully,

W. A. BRISTOW.

Low Temperature Carbonisation, Ltd.,
28 Grosvenor Place,
London, S.W.1.
January 1, 1938.

Artificial Leather Manufacture

A German Product

ARTIFICIAL leather, which has been growing in popularity in Germany, is obtained by agglomerating scraps of leather reduced to a fibrous mass with an emulsion of vinylic or acrylic polymerised resins. These resins are prepared by the emulsification of their monomers, which are then polymerised in this emulsified form. Various characteristics can be given to the leather by the proper choice of the substance used. Thus a polyvinyl chloride gives a fireproof leather of great tensile strength, but which is rather hard and has to be softened. The acetate, which has a high sticking power, is also a little hard. The polyacrylic esters give a more elastic leather which is water-proof and especially oil-proof. The mixture used is about 65 to 75 per cent. of leather fibre with 35 to 25 per cent. of emulsion. This mixture has been found to be much superior to a mixture of leather with latex or rubber.

Studies recently carried out on samples of real and artificial leathers have given the following results:

	Leather	With latex	With resins.
Tensile strength	220 to 350 kg.	95 to 125 kg	192 kg. per sq. cm
Elongation	12 to 18%	40 to 60%	15.7%
Absorption in 24 hrs	25 to 35%	8 to 13%	20.7%
Amount of wear, dry.	0.09 — 0.13 gr.	0.10 — 0.14 gr.	0.08 gr.
Amount of wear, wet.	0.09 — 0.14 gr.	0.19 — 9.25 gr.	0.17 gr.

An Editor for Fifty Years

Retirement of Mr. E. Heuner

MR. E. HEUNER retired from the editorship of *The British Trade Journal and Export World* at the end of the year. He had been associated with the paper in an editorial capacity for nearly sixty years, and was appointed to the editorial chair in 1888. He had thus served as editor for exactly fifty years, a term to which few, if any, parallels can be found in the history of journalism.

Before leaving Bouverie House Mr. Heuner was presented with a silver salver, suitably inscribed, by Sir Ernest Benn on behalf of himself and the other directors of Benn Brothers. Mr. Heuner, whose soundness of economic principle is as clearly stamped on his last issue of *The British Trade Journal* as it was on his first, proposes to spend his years of retirement at Hove.

SELENIUM can be estimated in the presence of sulphur and tellurium with the aid of pyrole, according to Saccardi and Martini (*Chimica*, 1937, No. 8, p. 210). The pyrole reaent consists of 80 drops of freshly distilled substance dissolved in 250 c.c. boiled distilled water, this solution being stable in the dark if the containers are kept full. A black precipitate is formed in the presence of 0.0008 gram selenium in 16 c.c. solution when treated with 10 c.c. of the pyrrole solution, while as little as 0.000046 gram of selenium is detected.

Technical Aspects of Some Modern Textile Effects

By
G. S. RANSHAW

It is natural when considering new season's productions, so far as they relate to the work of the dyer, printer or finisher, to adopt newness or novelty as a criterion. Yet so many of the effects which are loosely termed "new" consist merely of old ideas and practices revived in a different guise or more developed form, that it is better to abandon the stricter classification and confine attention to developments in which some fact, process or idea, whether intrinsically new or not, is adapted specifically and with striking result to meet the particular trend of fashion at the moment.

The introduction of viscose staple fibre into the textile raw material economy has been attended by results no less striking than those which attended the commercial development of continuous filament rayon. A number of problems in connection with its use remain to be solved, however, not the least of these being concerned with its use alongside wool. Up till recently, for instance, it has often been difficult to obtain solid shades on fabrics composed of yarns consisting of wool and staple fibre, yet there is a large field in which such yarns could be used if solid shades fast to light and washing could be obtained easily and economically.

Dyeing Process for Wool-Staple Fibre

A very recent process, due to the I.C.I., in which a special method of using the range of solubilised vat dyestuffs (Soledon colours) has been developed, aims at attaining this object. According to this process, the material is first padded with an aqueous solution of the dyestuff, followed by drying and steaming, the colour being finally developed in an acid persulphate bath. The padding operation is conducted at 60° C. and the steaming at 100° C. Fixation on the wool and partial fixation on the staple fibre occurs during steaming; fixation on the staple fibre is completed during the development. The regulated addition of auxiliary products (1) to increase the solubility of the dyestuffs; (2) to assist wetting of the fabric; (3) to develop acid during the steaming process; and (4) to cause a slight swelling of the fibres, is provided for.

The ease and cheapness of applying the dyestuff by this method removes one of the major difficulties in the development of thoroughly serviceable fabrics with new and attractive characteristics. These will mostly be in the brighter shades and destined for ladies' and children's wear. Another development, this time in finishing, enlarges the scope and utility of all types of staple fibre dresswear fabrics. This is the successful application of the two well-known shrinking processes to fibre. Results on the continuous filament viscose have been frankly disappointing, and the fully shrunk finish can at present be applied to only a few constructions, but even the popular lines in staple fibre have been successfully shrunk mechanically, with the result that the characteristics of the fabrics are strikingly enhanced. They print better, handle better, and display less tendency to crease and crush. These are facts of great importance for the successful exploitation of staple fibre in the dress-goods trade and form an element in its favour when competing with continuous filament.

Pre-Creping

A noteworthy feature of recent processing has been the increasing degree in which resort has been had to pre-creping, *i.e.*, the method of embossing patterns on crepe constructions in order primarily to pre-determine the type of pebble or crepe figure that will subsequently be produced in scouring and creping, and thus to promote uniformity. The use of this process has led to the production of some very interesting and serviceable cloths in the cheaper constructions, but the vogue for surface structure has led to its even wider development with a view to adding a distinct embossed pattern resembling the jacquard patterns, otherwise obtained with greater labour and expense.

One of the surprises in this connection has been the ease with which the recently introduced cuprammonium crepe fabrics can be pre-embossed and the relatively permanent effect obtained. The cuprammonium crepe yarns themselves are worthy of mention here, since they are being loomed without difficulty and are being finished to fabrics which are really distinctive in appearance and handle.

Turning to the work of the printer in producing the styles of the moment, comment must be made on the extent to which the vogue for screen-printed goods has developed in this country and the success which has attended the efforts of screen printers to adapt themselves to current requirements. Here we have virtually a development of stencil-printing with its advantages of economy in operation and variety of output, but without the severe limitations imposed on the type of design which can be laid down successfully. Screen-printing is admirably adapted to meet the needs of the moment where more emphasis is laid on novelty of design than on long runs, since the screen printer is able to tackle orders which it would be uneconomic to undertake by machine or block work. Not only are handkerchiefs, squares, bias scarves and other smallwares being screen-printed, but a successful eight-colour design, incorporating a matt pattern effect, has recently had a good sale as a 36-in. dress material. The designs used in this country are usually the print-on type, but single-colour discharge work has been tackled, as have vat prints, while as many as twenty-four screens have been used to produce one design for a furnishing fabric.

Stencil Printing

Mention has been made of stencil-printing. In one respect, at least, this method of obtaining a printed design has been given a new life. It was probably the Coronation influence which was responsible for the introduction of gold and silver effects combined with bright heraldic colours, and whereas these would formerly have been contained by the use of metallic pigments and been applied only to the more expensive dress silks, the existence of various new synthetic lacquers, many produced on a cellulose basis, naturally led the rayon manufacturers to consider their suitability for application to viscose and acetate fabrics. This was probably responsible for the emergence of the popular lacquer print which is most successfully produced by the use of the stencil and the spray-gun. Specially mixed cellulose lacquers are used and these are generally of the nitrocellulose variety where the ground is viscose rayon, but they cannot be used with acetate since the solvent would affect the acetylcellulose of the fibres. There are, however, numerous ways of producing a lacquer effect from the acetate itself.

Matt printed effects have been prominent of late and are still being developed. There are numerous ways of producing these on acetate, one being to deposit zinc oxide by padding, such portions of the material as are desired to remain unaffected, *i.e.*, lustrous, being protected from the action of the pigment by a mechanical resist such as gum arabic. Dyestuffs of the "Duranol" type may be incorporated in the resist for coloured effects if desired. Damask effects on viscose may be obtained by the use of white pigments as filling agents together with certain fixing agents specially developed. The well-known ciré effects are now being successfully produced by spraying on the fabric an aqueous emulsion of special synthetic waxes followed by partial drying, and hot calendering under pressure. Crepe satins are specially suitable for receiving these effects, and ciré patterns may be obtained by stencils.

Bleaching and Dyeing

Mechanical Problems associated with the Kier

SOME mechanical problems in bleaching and dyeing were reviewed by Mr. J. F. Straatman, of Delft, in a paper read at a joint meeting of the Manchester section of the Society of Dyers and Colourists and the chemical section of the Manchester Literary and Philosophical Society, when Mr. H. Hayhurst presided.

Variable Conditions in the Kier

During the post-War period an enormous amount of research work, and the publication of a certain amount of literature, had materially increased knowledge in regard to the chemical and physical sides of bleaching and dyeing, said Mr. Straatman. It was a curious coincidence that in nearly all the bleaching works of the world that most important part of the machinery, namely the kier, had remained practically unaltered during the past 40 to 50 years, though occasionally attempts had been made to revolutionise the process of bleaching. A kier must be a vessel to contain cotton which was impure, and in which that cotton could be treated with a lye of soda ash and caustic soda with the least possible expenditure of power, steam, chemicals and labour. The impurities of the cotton must be dissolved or else emulsified to such an extent that they could be washed off the cotton to a very great degree. There must be no stains left, the cotton must be of the lightest possible colour, and there must be as little possible change in the cellulose.

Several schools of thought prevailed. One school held that the more circulation there was in the kier the better; a second school held that the more pressure the better; a third school held that the higher the temperature the better. They all appeared to be correct. The lye in the kier must attack the impurities of the cotton by emulsification, by saponification and by chemical degradation. These were chemico-physical problems. Chemical reactions would proceed better at a higher temperature. Physical reactions would proceed better by means of increased circulation.

The kier most used in England was an open-type vessel with a false bottom, usually referred to as the grids, on which the cloth was piled, soaked in lye. The liquor was circulated by means of an injector which sucked the lye from over the grids, and distributed it in a sort of spray. From the point of view of the chemical engineer this appeared to be wrong. Spraying a liquid might cause air to be associated with it, which might have an undesirable action upon the cellulose. As a heater the injector was inefficient for the purpose of circulation, while it consumed extra steam. This type of kier was commonly termed the "vomiting" kier. The injector dealt with a double function in an inefficient way. If the problem was pressure and temperature it did not solve it, and, if, again, it was circulation, then again it was not solved. There was intermittent circulation, and there was no equilibrium between the volume of liquor which the injector was capable of displacing, say, for a minute, and the volume of liquor which, say, for a minute, flowed downwards by gravity through the pile of the fabric in the kier.

Operation of the Pump

Mr. Straatman described the operation of a vertical high pressure kier fitted with a pump. The pump used should be of the centrifugal type, which, according to text-books, worked best when the liquor flowed freely into it, and when no air could be present in the supply pipe or even in the pump itself. Placing the pump lower than the grid would apparently fulfil the necessary conditions, although this was by no means certain. It was not possible to see through the sides of the kier to make sure that the pump was actively working during the boiling period.

Engineers now considered it to be best to fit the kier with a pump which was not efficient, but which gave "slip." A Continental method of heating was by means of coils of steam pipes in the kier placed under the grids, but this could be classed as an inefficient system. Another system which was practically in general use was by means of a tubular heater in the pressure line of the pump; this was better. The pump must be inefficient, and must give "slip," in order not to create a vapour phase under the grid. There should be a certain amount of play between the impeller and the casing. This play became less if scale was formed in the kier; the more scale the less play and the more efficient became the pump. Scale would form also on the inside walls of the pump where it could not be seen, and if not removed the pump would become too efficient for the kier. A vapour phase, even if only persisting for a fraction of a second, might cause strongly constructed grids to break.

The Efficiency of the Kier

At the very best the kier was a most inefficient piece of machinery, said Mr. Straatman. The efficiency of the pump was limited by the drop in temperature of the lye proceeding downwards from the beam through the piled cloths to the grids. Apparently, the greater the drop in temperature the more efficient the pump and the more efficient the circulation, and the less the thermal efficiency of the kier the better was its mechanical efficiency. This seemed strange, but it appeared to be correct. In practical beam dyeing it was of the utmost importance to be able to reverse the flow of the dye liquor every 5 or 10 minutes. The dye liquor must flow, as a rule, from the outside to the inside of the cops and cheeses. The pump must not press because if it did the cops would be pressed off the perforated tubes. A reversing attachment should be adopted.

Lever Brothers and Unilever

Changes in Directorate

CHANGES on the boards of Lever Brothers and Unilever, Ltd., and Lever Brothers and Unilever N.V. are announced. Dr. R. J. H. Patijn, Mr. Horatio Ballantyne, Mr. J. W. Pearson, and the Marquess of Carisbrooke have resigned from their directorships and have been appointed advisory directors of both companies. In order to fill vacancies which have arisen from these appointments, Messrs. H. Davis, J. L. Heyworth, and J. P. Van den Bergh have been appointed members of the board of the English company.

In order that the personnel of the boards of the English and Dutch companies should be the same, Messrs. Arthur Hartog, P. D. H. Hendriks, Henri Jurgens, Rudolf Jurgens, Dr. J. L. Polak, and Mr. Franz Schicht, who are at present members of the board of Unilever, Ltd., have, in consequence of the amalgamation with Lever Brothers, Ltd., been appointed members of the Board of Lever Brothers and Unilever, Ltd.

In the English company, Viscount Leverhulme will be governor, Mr. F. D'Arcy Cooper chairman, and Messrs. H. R. Greenhalgh and Albert Van den Bergh joint vice-chairmen of the board. In the Dutch company, Mr. George Schicht will be governor, Mr. P. Rykens and Dr. Heinrich Schicht will be joint chairmen, and Messrs. Arthur Hartog and Rudolf Jurgens joint vice-chairmen of the board. The alteration of the articles of association necessitated by these appointments will be submitted to the next general meeting of shareholders.

THE Belgian rayon industry is reported to be experiencing a boom. The Fabelta concern is putting a new factory into production at Zwijnaerde and has commenced the manufacture of staple fibre. Large scale experiments on production of casein fibre have also been instituted.

Lord Rutherford's Last Presidential Address

Opening of the Indian Science Congress

THE late Lord Rutherford had prepared his presidential address to the Indian Science Congress Association, and he was to have delivered it at the association's silver jubilee meeting in Calcutta on January 3. After his unexpected death, however, the Indian Association invited Sir James Jeans to assume the presidency. As a consequence of this, Sir James, after a short introductory speech, read a large part of Lord Rutherford's address.

This address contained three leading themes. The first concerned the planning of research. The second dealt in some detail with the British Government's system of aid to scientific research in Britain, with the aim of presenting suggestions to the Government of India as to how it could best encourage research. The third theme was devoted to a review of recent advances in experimental research on atomic physics.

Regarding the first theme, Lord Rutherford wrote: "If India is determined to do all she can to raise the standards of life and health of her peoples and to hold her own in the markets of the world, more and more use must be made of the help that science can give. Science can help her to make the best use of her material resources of all kinds and to ensure that her industries are run on the most efficient lines. National research requires national planning."

Lord Rutherford also described in simple terms the recent discoveries of the positive electron, the neutron, artificial radioactivity, and the disintegration of atoms by machines of human construction. Concerning these advances and the increase in the development of technique with which they have been achieved, he wrote: "I cannot but reflect on the amazing contrast between my first experiment on the transmutation of nitrogen in the University of Manchester in 1919 and the large-scale experiments on transmutation which are now in progress in many parts of the world. In the one case, imagine an observer in a dark room with very simple apparatus painfully counting with a microscope a few faint scintillations originating from the bombardment of nitrogen (by particles from radioactive materials). Contrast this with the large-scale apparatus now in use for experiments on transmutation in Cambridge. A great hall contains massive and elaborate machinery, rising tier on tier, to give a steady potential of about two million volts."

In another passage Lord Rutherford stated that Professor Lawrence, of the University of California has shown that "the bombardment of bismuth by very fast deuterons leads to the production of a radioactive bismuth isotope which is identical with the well-known natural radioactive product radium E. Many artificial radioactive elements can be produced, often in great intensity. For example, the bombardment of common salt by fast deuterons gives rise to a radioactive isotope of sodium. This breaks up with a half period of 15 hours, emitting not only fast beta particles but rays at least as penetrating as those from radium. It may well be that in course of time such artificial radioactive elements may prove a useful substitute for radium in therapeutic work. By these methods also such intense sources of neutrons can be produced that special precautions have to be taken for the safety of the operators of the apparatus."

Fertiliser Consumption Trend

Report of the British Sulphate of Ammonia Federation Ltd.

THE 17th annual report of the British Sulphate of Ammonia Federation, Ltd., for the year ended June 30, 1937, states that the year under review was the 40th year of propaganda work undertaken successively by the Sulphate of Ammonia Committee, the Association, the Federation, Nitram, Ltd., and Imperial Chemical Industries, Ltd.

It is estimated that there was an increase of 201,000 metric tons of nitrogen, or about 8.4 per cent., in the actual production of the forms of nitrogen for which statistics are given. The production in Chile increased by 14,000 tons, or 7 per cent., and output in other countries increased by 187,000 tons, or 9 per cent. As in the previous year, the most marked increases in manufactured nitrogen output have been in Germany, Japan, and the United States. Synthetic nitrogen plants, on an average, operated at only about 50 per cent. of capacity during the year: the world production capacity for synthetic nitrogen, including cyanamide, is estimated at 3,900,000 tons of nitrogen. The total consumption increased by 258,099 tons, or about 10.7 per cent., following an increase of 16.7 per cent. last year.

The increase in fertiliser nitrogen consumption was 261,000 metric tons, or 12.5 per cent., as compared with 15.0 per cent. in the previous year. Each main class of fertiliser showed an increase; ammonium sulphate (including ammonia for mixed fertilisers) increased by 130,764 tons of nitrogen, or 12.9 per cent., over the 1935/36 figure. In individual countries, the largest tonnage increases in nitrogen consumption have been mostly in the same countries as last year, *viz.* in Germany, the United States, Japan, Russia, China and France. The increase in the consumption of ammonium sulphate in Asia is particularly noteworthy—almost 100,000 tons N, or three-quarters of the total world increase. About two-thirds of the Asiatic increment has been in the Japanese Empire, one-fifth in China, and the remainder in most of the other markets. In Europe the catastrophic fall in consumption in Spain, due to the Civil War, was more than counterbalanced by large increases in other countries, particularly Germany, where prices were reduced by 30 per cent. by Government decree.

The order of importance in the production and consumption of nitrogen for agricultural use remains roughly as in recent years, *viz.*: ammonium sulphate, 47-49 per cent. of all fertiliser nitrogen; cyanamide 11-13 per cent; Chile nitrate 9-10 per cent.; lime ammonium nitrate ("Nitro-chalk" forms) 8-9 per cent.; calcium nitrate 7-8 per cent.; sodium nitrate (for fertiliser) 3-4 per cent., and other synthetic nitrogenous fertilisers 9-12 per cent.

Home consumption of sulphate of ammonia showed an increase on the 1935/36 figures of 6,300 tons, or 2.9 per cent., following an increase of 4.9 per cent. in the previous year. Prices were the same as in the two previous years. The increase in the consumption in Scotland was 9.8 per cent. and in Ireland 6.2 per cent., but in England and Wales there was a slight decline of 0.5 per cent. The total consumption of pure nitrogen in the British Isles for all purposes amounted to about 95,100 metric tons, against 91,800 tons last year, an increase of 3.6 per cent. The tonnage used in industry is estimated at 29,100 tons, against 28,800 last year. Total exports of ammonium sulphate from Great Britain and Ireland show an increase of 44,414 tons or about 22 per cent. on last year's figures.

APPLICATION of the flotation method to the manufacture of boric acid and borax has been recently investigated. Using abietic acid as flotation agent and lead nitrate as activator, mixtures with boric acid content ranging from 6 to 50 per cent. were concentrated to 78 to 99 per cent.

Drying and Air Conditioning

A Symposium held by the American Chemical Society

A SYMPOSIUM on drying and air conditioning was held by the Division of Industrial and Engineering Chemistry of the American Chemical Society at the University of Pennsylvania, on December 27-28.

The basic equations for the rate of heat and mass transfer were reviewed by E. R. Gilliland, of the Massachusetts Institute of Technology. The mass transfer coefficients were considered in the light of the film and turbulent-core concept as well as on the basis of empirical dimensional equations. Data on the rate of evaporation of liquids into a turbulent air stream in a wetter-wall tower, when considered on the basis of the film and turbulent-core concept indicate that the resistance of the core and film are of the same order of magnitude, the ratio of the two depending on the diffusivity of the system in question. Data on the simultaneous transfer of heat and mass were considered on the basis of the same concept, and were shown to lead to an analogy between heat and mass transfer, which does not involve the inclusion of the analogy to fluid friction. In the case of drying, the problem was complicated by the lack of knowledge of the mechanism of fluid motion through solids. The use of a diffusion equation in this last case is very questionable, especially when the driving force causing diffusion is based on the weight of liquid per unit weight of solid, because the movement of the fluid may be in the opposite direction to that indicated by the driving force in these units.

Applications of Activated Alumina

The development of activated alumina, and of improved equipment suited for its commercial use, has resulted in practical gas drying and dehumidifying processes which are broadening the applications in which removal of moisture can be accomplished economically, said R. B. Derr, of the Aluminium Co. of America. It was shown that the temperatures developed in the adsorbent by the heat of adsorption may exceed the boiling point of water and that the elimination of this heat increases the capacity of the adsorbent. The relative quantity of gas dried under several conditions of flow rate and humidity were shown graphically. Complete drying and partial dehumidification were discussed and illustrated by photographs of commercial equipment now in use.

Improvement in the accuracy of dew point indication should increase its usefulness as a research tool, as for example in the investigation of phase equilibria, stated Arthur W. Hixson, of Columbia University, and G. Edwin White, of the College of the City of New York. The apparatus used in this investigation was designed with a view to being applicable to confined systems. Instrumental observation of dew is obtained through photoelectric measurement of the amount of light reflected from the metal mirror on which dew is deposited. There is minimisation of temperature gradient error within the apparatus, by use of a thermocouple mounted in the surface of the dew mirror. Minimisation of error was due to temperature gradient across the dew, through the practical elimination of dew remaining on the mirror at the time mirror temperature reaches the dew point.

The partial molal heat of vaporisation, the vapour pressure, dew point, and solubility relations of solutions of lithium chloride have been calculated and compared with all available experimental data, stated F. R. Bichowsky, of the Dow Chemical Company. The entire range of concentration is covered and temperatures from −20 to 160° C. New data are presented of the vapour pressure and boiling points of the more concentrated solutions. A new thermodynamic property of solutions, the wet bulb rise, is defined and calculated. The method of conditioning air by means of strong solutions was described and illustrated, examples being worked out to show the application of data to practical industrial problems. It was shown that drying efficiencies of over 100 per cent. can be obtained by a completely adiabatic cycle, as compared with the efficiencies ranging from 10 to 30 per cent. in the more usual processes of drying. In actual practice, operating costs of low-temperature drying by this system have ranged as low as 4 per cent. of the operating costs of drying using refrigerated air, and 10 to 30 per cent. of the cost of drying under comparable conditions using heat only.

Dealing with the drying of a commercial solid, R. C. Ernst, D. B. Ardern and F. M. Tiller, of the University of Louisville, said that commercial prussian blue had been dried under various conditions in semi-commercial air and vacuum dryers. The air drying was carried out at air temperatures of 140-180° F. and humidity of 10-20 per cent. Vacuum of 18-26 inches of mercury and shelf temperatures of 212-266 were used. The rate curves for both air and vacuum drying were of the retarded type. The effect of temperature and pressure on the rates are especially notable.

Some technical and economic aspects of spray drying were discussed by Ben B. Fogler and Robert V. Kleinschmidt, of Arthur D. Little, Inc. In spray drying a solution or slurry containing the desired solid material is continuously sprayed into a chamber and subjected to the action of a stream of drying gas, usually pre-heated air or diluted products of combustion. One of the most important aspects of the process was the physical form of the product, which is usually granular, the individual particles being generally rounded in shape and hollow to a degree which is controllable over a rather wide range in the operation of the process. For many materials a product in this form has important advantages, chief of which are rapid solubility, lessened hygroscopicity and unusual mobility in handling.

An important advantage of spray drying was the very rapid rate and relatively low material temperature at which drying is accomplished. From fifteen to thirty seconds is a fair estimate of the time of a particle in the spray drying chamber in passing from liquid to solid form while the particle temperature need not rise materially above the wet bulb temperature of the liquid of the solution. This makes the process particularly adapted to the drying of heat sensitive materials, some of its most important applications being the drying of milk, eggs, potato flour, soap and blood.

The Testing of Gelatine

British Standard Methods

THE British Standards Institution has just issued standard methods for testing gelatines. These methods, which have been prepared by a representative committee, under the chairmanship of Mr. R. Duncalfe, represent the experience of the gelatine industry over a number of years. Both purchasers and users have pooled their experience, and these methods have been selected, after careful trial.

The detailed methods given in this standard specification include those for the determination of moisture, jelly strength, viscosity, melting point, foam, water absorption, solubility, keeping quality, *p*H, grease, ash, sulphur dioxide, chlorides, colour, clarity, arsenic and heavy metals. It is pointed out in the foreword that it will not be necessary in all cases for the whole of the tests to be carried out, but that the necessary tests will depend upon the purpose for which the gelatine is intended. These methods include the testing of gelatines of edible quality utilised, for example, in the confectionery, table jelly, meat product and other food trades, as well as gelatines for industrial purposes.

Copies of this British Standard Specification No. 757 can be obtained from the Publications Department, British Standards Institution, 28 Victoria Street, London, S.W.1, price 3s. 6d. or 3s. 8d. post free

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Non-phenolic auxiliaries for mercerising. Michel, *Teint. Imp Blanch. App., 15,* 555-559.

Chemistry of silk and silk processing. Scott, *Amer. Dyestuff Reporter, 26,* 756-758, 770-778.

Glass, Ceramics

Vitreous or porcelain enamelling. Sténe, *Metal Ind. (U.S.A.), 35,* 622-623.

Fluorescent glass. Gilard, Dubrul, Jamar and Crespin, *Verre Silicates Ind., 8,* 414-416.

Crystalline products in commercial glasses. Holland and Preston, *J. Soc. Glass Techn., 21,* 395-408.

Metals, Electrometallurgy

Preparation of pure gold. Stas, *Bull, Soc. Chim. Belge, 46,* 377-379.

Rochelle salt-copper cyanide plating bath. Graham and Read, *Metal Ind. (U.S.A.), 35,* 617-621.

Corrosion of zinc. Taboury and Gray, *Comp. rend., 205,* 985-987.

Electrochemistry of metallic coatings. Hoar, *Metal Ind., 51,* 649-652.

Fats, Oils, Waxes

Pretreating linseed oil for oilcloth manufacture. Blohm, *Nitrocellulose, 8,* 196-197.

Hydrogenated soap fats. Kemp, *Soap, 13,* No. 12, 23-26.

Potash soaps. Vallance, *Soap, 13,* No. 12, 31-33, 121.

Action of water on the drying of fatty oils. Auer and Lewis, *Paint Varnish Production Manager, 17,* No. 6, 12-18.

Hydrogenation of fats. *Seifensieder Ztg., 64,* 901-903.

Synthetic drying oils. Mellan, *National Paint Bull., 1,* No. 12, 12-13.

Wool fat and wool fat alcohol. Gänssee, *Fette u. Seifen, 44,* 460-462.

Non-saponifiables, polybromide and hydroxyl numbers. Fiedler, *Fette u. Seifen, 44,* 471-480.

Continuous extraction of vegetable oils. Terres, *Fette u. Seifen, 44,* 483-485.

The constitution of fatty substances. Kissileff, *Teintex, 2,* 722-729.

Paints, Pigments, Resins

Stability of dipping varnishes and enamels. *Paint Oil Chem. Rev., 99,* No. 23, 84-91.

Synthetic resin and chlorinated rubber anti-corrosive paints. Jones, *Ind. Chem., 13,* 486-487.

Aluminium pigments. Harris, *National Paint Bull., 1,* No. 12, 10-11.

Rubber, Plastics

Researches in plastic materials. Morgan, *Chem. and Ind., 57,* 3-11.

Latex applications. Purkiss, *India-Rubber J., 95,* No. 1, 13-19.

Transparent films from seaweed. Pehorey, *Rev. Générale Matières Plastiques, 35,* 270-274.

Neoprene. Starkweather and Walker, *Ind. Eng. Chem., 29,* 1,380-1,384.

Dye, lake and mineral pigments for rubber. Jones and Stern, *Paint Manuf., 7,* 387-388.

Miscellaneous

The active groups in ferments. Karrer, *Bull. Soc. Chim. Belg., 46,* 351-363.

Production of high temperatures. Lax and Schön, *Chem. Apparatur, 24,* 361-363.

Modern water treatment. Schilling, *Chem. Fabrik, 10,* 504-508.

The glycols in industry. Harry, *Paint Manuf., 7,* 378-380.

Wood preservatives. Richardson, *Chem. and Ind., 56,* 1,148-1,152.

Personal Notes

MR. HERBERT DELDICOAT, A.I.C., has been appointed assistant anaylst and assistant gas examiner by the Liverpool Corporation Health Committee.

MR. C. S. W. HARRISS has been appointed secretary of the Imperial Continental Gas Association on the retirement of Mr. W. E. Bowers, after 42 years' service.

MR. ROBERT ERNEST WAINWRIGHT, of Grove Lodge, Ilkley, a director of Moorhouse and Wainwright, dyers, Horsforth, left estate valued £36,094, with net personalty, £34,770.

MR. H. HAYHURST, A.I.C., A.M.I. Chem.E., of Blackburn, has been appointed chief chemist, research department, L.M.S. Railway, Horwich. He started his duties on January 1.

MR. J. F. SCHUBELER, managing director of Sulzer Bros. (London), Ltd., has resigned his seat on the board. MR. R. M. ATKINSON, hitherto of Vickers, Ltd., has been appointed to succeed him.

MAJOR JOHN PHILP AND MRS. PHILP, of Menstrie, have celebrated their golden wedding. Major Philp retired in 1930 after fifty years' service with the Distillers Co., Ltd., at Glenochil.

MR. WILLIAM DIAMOND, who has been manager at Monkton Chemical Works, has returned to Marley Hill Chemical Works as manager. He held that post for 30 years before going to Monkton works.

PROFESSOR N. T. M. WILSMORE retired from the chair of Chemistry at the University of Western Australia, at the end of December. He will be succeeded by PROFESSOR N. S. BAYLISS, who takes up duties early in February.

MR. HARRY W. KALEY has been appointed general sales manager of the Ethyl Gasoline Corporation. Mr. Kaley has been connected with the Corporation for eleven years, serving as advertising manager and assistant sales manager.

DR. FRANCIS WILLIAM ASTON, of Cambridge University, and PROFESSOR ERNEST BARKER, of Cambridge, have received honorary degrees from the University of Calcutta, on the occasion of the jubilee meetings of the Indian Science Congress Association.

MR. MAURICE LINFOOT, of the Knoll, Bocking, and Daw Street Farm, Finchingfield, farmer, formerly general manager of the Bocking factory of Courtaulds, Ltd., artificial silk manufacturers, left estate valued £82,885, with net personalty £73,583.

MR. FRANK GASKELL, of Pendrell Hall, Godsall, Staffordshire, formerly of Gaskell, Deacon and Co., chemical manufacturers, who died on October 24, 1937, at the age of 84, has left estate valued £507,614, with net personalty £463,691, on which estate duty of £156,278 has been paid.

MR. FRANCIS NEVILLE CHAMBERLAIN, who is employed as a salesman by Imperial Chemical Industries (Metals) Ltd., at Birmingham, and is son of the Prime Minister, has joined the 69th (Royal Warwickshire Regiment) Anti-Aircraft Brigade, Royal Artillery (Territorial Army) as a gunner.

DR. J. D. A. JOHNSON has been appointed head of the chemistry department at the Royal Technical College, Salford, in succession to Mr. E. Clark, B.Sc. (former vice-principal), who has retired. Dr. Johnson has been lecturer in chemistry at the Liverpool City Technical College since 1932. Whilst in Liverpool he was a research assistant to Professor Gibson, F.R.S., in chemical defence research work.

New Year's Honours List

DR. JOSEPH WILLIAM MELLOR, F.R.S., lately director of the British Refractories Research Association, has received a C.B.E. (Civil Division) in the New Year's Honours List. DR. REGINALD SYDNEY GILBERT KNIGHT, F.I.C., manager and deputy superintendent, R.N. Cordite Factory, Holton Heath, has received an O.B.E. (Civil Division)

OBITUARY

MR. JOHN MACFARLANE, chairman of William Fulton and Sons, Ltd., dyers and finishers, Glenfield Works, Paisley, has died.

MR. GEORGE FELL MILNER, who was placed in charge of the surplus disposals section of the purchasing department of Imperial Chemical Industries, Ltd., in London, on the formation of the company, died at Christmas. He was the second son of the late Mr. Edward Milner, a director of Brunner, Mond and Co., Ltd., Winnington. Born in 1888, he was educated at Bootham School, York, and at Manchester University. During the war he served abroad as a lieutenant in the 5th Cheshire Regiment. The funeral took place at Golders Green on December 28.

Foreign Chemical Notes

Latvia

A FISH OIL AND MEAL FACTORY is to be built at Libau by the Ministry of Agriculture, at a cost of 70,000 lat.

Holland

THE AMSTERDAMSCHE SUPERFOSFAATSFABRIEK and Vereenigde Chemische Fabrieken announces a net profit of 540,000 Dutch florins for the year ending April 30, 1937. Ordinary shares receive a dividend of 5 per cent. and the preference shares of the Vereinigte Chemische Fabriken one of 6 per cent. The latter shares also receive 4 per cent. on account of dividend arrears which are now reduced to 20 per cent.

Japan

A NEW ELECTROLYTIC CHLORINE PLANT with a daily capacity of 50 tons chlorine is under construction by the Sanyo Pulp Co.

A NEW FACTORY FOR MANUFACTURE OF OXALIC ACID and formic acid, with a monthly output of 100 tons, is under construction by the Chosen Chissohiryo K.K. (Korean Nitrogeneous Fertiliser Co.).

France

CASEIN WOOL PRODUCTION at Wasquehal is expected to commence next year.

PRODUCTION OF SYNTHETIC RESINS will be undertaken by the Soresyn Resines Synthetiques et Derives, of 43 Avenue de l'Opera, Paris, recently formed with a capital of 100,000 francs.

THE COMPAGNE INTERNATIONALE DE PARFUMERIE has been formed as a holding company to take over the interests of the various Coty concerns in Argentine, Brazil, Italy, Mexico, Great Britain and Roumania.

Russia

THE GROSNY PARAFFIN WAX WORKS are being modernised and extended.

A SEMI-WORKS PLANT IS TO BE ERECTED by the Apatite Trust to study the possibilities of titanium ore deposits located on the Kola Peninsula. Situated about 100 miles from Murmansk and about 1½ miles from the railway station of Afrikanda, the ore deposits are estimated to total about 27 million tons and contain (apart from titanium) such rare metals as niobium and tantalum.

NITROGEN PEROXIDE POSSESSES ADVANTAGES OVER NITRIC ACID in the nitration of pyridine or quinoline, according to Choryguine and Toptshiev (*J. Obchetch. Khim.*, 1937, *7*, 193). The optimum reaction temperature in pyridine nitration is 115 to 120° C. when a 10 per cent. yield of beta-nitro-pyridine is obtained and the greater part of the unreacted pyridine is recoverable. Nitration of quinoline at the optimum temperature of 95 to 100° C. gives 7-nitroquinoline, while operation at 133 to 160° C. results in formation of 5.7-dinitroquinoline.

From Week to Week

AN INDEX to Volume XXXVII of THE CHEMICAL AGE (July to December, 1937), is published with this issue. It will be found between the last advertisement page and the inside back cover, and is easily detached for binding purposes.

RADIUM COMPOUNDS continue to be exempt from Key Industry duty till August 31, 1938, by an Order under Section 10(5) of the Finance Act, 1926.

THE REGISTERED OFFICES of St. Kitts (Basse Terre) Sugar Factory, Ltd., St. Kitts (London) Sugar Factory, Ltd., Ste. Madeleine Sugar Co., and Antigua Sugar Factory, Ltd., have been moved to 5 Lawrence Pountney Hill, E.C.4.

WE REGRET TO ANNOUNCE the death on December 22, of Mrs. Amy Ludford, the wife of Mr. W. C. G. Ludford, of the Four Oaks Spraying Machine Co., Four Oaks, Birmingham, at the age of 77. She was buried at Canwell Church on Christmas Eve

IN HIS NEW YEAR MESSAGE to the Mexican people, President Cardenas made it clear that the British-managed Mexican Eagle Oil Co. would be compelled to pay royalties not only on the valuable concessions in the Pozarica field, which it was granted on November 11, but also on properties which it held before.

THE ESTABLISHMENT OF A MEAT EXTRACT INDUSTRY in the Union of South Africa was discussed before the Rural Industries Commission when sitting in Durban. Such an industry operating the Watkins Pitchford process would require an initial minimum capital of £100,000, which, it was suggested, the Government should guarantee for three years.

SOUTH YORKSHIRE COKE PRODUCERS have arranged new contracts with Midland ironmasters for the supply of blast-furnace coke for twelve months from January 1 at 30s. a ton on rail at the ovens. This price compares with 27s. 6d. a ton which has recently operated under the sliding-scale agreement. All grades of metallurgical coke are now in full demand.

A PILOT PLANT FOR MAKING CYANIDE for the gold mines, capacity 500 tons, has been operating for some time on the Witwatersrand. There seems a likelihood, however, of a large industry being developed for this purpose, as the mines are consuming between 17,000,000 and 20,000,000 lb. of cyanide per year, the value of which would be nearly £500,000. At present there is an annual importation of cyanide worth at least £400,000.

THE COMPRESSED GAS MANUFACTURERS' ASSOCIATION, Inc., of New York, is holding its silver jubilee meeting on January 17 and 18. For a quarter of a century the association has handled the technical problems of the many-sided industries which include the production and distribution of commercial gases, such as ammonia, sulphur dioxide, acetylene, carbon dioxide, oxygen, and the liquefied petroleum gases. It has also taken a leading part in matters of safety such as safety in design of containers and methods of safe handling and transporting commercial gases in liquid form and under pressure.

THE SCHEME TO START A NEW INDUSTRY at Jarrow for making bright steel rods is now almost assured. It is understood that the Steel Federation has agreed to allow the promoters a quota of steel for manufacturing, and that the Commissioner for Special Areas is favourably impressed with the scheme with regard to making a grant. It is proposed to start the works in the old tramway sheds, and about 50 men will be employed. The promoters include Mr. R. A. Whitfield, who was connected with the first Jarrow steelworks scheme, which fell through, and Bernard Holland and Co., engineers, of London.

AN AGREEMENT HAS BEEN REACHED by which the Mene Grande Oil Co., a Venezuelan affiliate of the Gulf Oil Corporation of Pennsylvania, will sell about half of its crude oil production to International Petroleum Co., a subsidiary of Imperial Oil, Ltd., which is a subsidiary of the Standard Oil Co., of New Jersey. This agreement is to operate for a long term of years. A payment of $25,000,000 has been made to the Mene Grande Company in anticipation of deliveries. This company is producing over 70,000 barrels a day, about half of which is marketed in the United States. International Petroleum will buy the remainder.

AMONG FURTHER SEASONABLE GIFTS WE HAVE RECEIVED, is a full desk-size blotting pad from S. Briggs and Co., Ltd., complete with a useful memo pad. The "Inventors and Patentees Diary" (1s. 9d.) issued by King's Patent Agency, Ltd., contains a special section of notes which summarise very clearly the main facts of British patent law and procedure. The notes outline the manner of applying for a patent and the progress of the application before the Patent Office. Robey and Co., Ltd., of Lincoln, have sent a clear black-on-white wall calendar with an attractive surround in buff and green, and Carty and Sons, Ltd., vat and tank makers, refill cards for a desk calendar.

RECENTLY ERECTED OFFICES of John Knight, Ltd., Royal Primrose Works, Silvertown, were gutted by fire on December 31.

AMONG PRODUCTS OF THE SOUTH AFRICAN CHEMICAL INDUSTRY in which improved business has recently been reported are volatile oils in the form of insecticides which are guaranteed not to stain.

A NEW DISTILLERY TOWER, 68 feet high and weighing 55 tons, has been supplied by Petrostruck, of Berlin, for Manchester Oil Refineries, Ltd., of Barton. It was conveyed to England in two pieces and was unloaded in the Manchester Ship Canal on December 28.

FATHERS OF LARGE FAMILIES employed by Pilkington Bros., Ltd., the St. Helens glass manufacturers, are to benefit by a scheme of endowment which the firm will introduce early next month. For each child of school age beyond three in a family a bonus of 5s. will be added to the father's weekly wage.

THE SUGAR COMMISSION is to be approached by Earl Winterton and urged that a licence be granted for the opening of a sugar-beet factory at Chichester. The suggestion has been put forward by Captain J. H. Robinson, chairman of the Beet Committee of the West Sussex Branch of the National Farmers' Union, who states that a company has bought a site at Chichester, but are unable to erect a factory in the absence of a licence from the Sugar Commission.

Forthcoming Events

London.

January 11.—Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, W.C.1. 8.30 p.m. Professor A. Wolf, "Some Aspects of the History of Pharmacy."

Society of Glass Technology. Annual dinner at the Trocadero Restaurant at 7.15 p.m.

January 12.—Society of Glass Technology. Institution of Electrical Engineers, Savoy Place, Victoria Embankment, S.W.1. Series of lectures, W. M. Hampton, "New Developments in the Field of Optical Glass"; Professor W. E. S. Turner, "Glass for General Scientific and Heat-resisting Purposes," etc.

Electrodepositors Technical Society, Northampton Polytechnic Institute, St. John Street, Clerkenwell. 8.15 p.m. A. I. Wynn-Williams, "Materials of Construction in Electrodeposition Plant."

January 13.—Institute of the Plastics Industry. British Industries House, Marble Arch, W.1. 7.30 p.m. Walter Landauer, "Design and the Plastics Industry."

January 18.—Institution of Chemical Engineers. Joint Meeting with the Institution of Civil Engineers, Great George Street, Westminster. 6 p.m. Dr. A. Parker, "The Treatment and Disposal of Trade Waste Waters."

Birmingham.

January 14.—Institute of the Plastics Industry. Joint meeting with the Birmingham Section and Plastics Group of the Society of Chemical Industry. James Watt Memorial Institute. 8 p.m. H. V. Potter, "The Economics of the Plastics Industry."

January 19.—Institute of Chemistry. H. W. Brownsdon, "Some Problems of Lubrication."

Bristol.

January 14.—Society of Chemical Industry. Woodland Road. 7.30 p.m. Joint meeting with Chemical Engineering Group. "Early Development of Chemical Industry in Bristol."

Derby.

January 18.—British Association of Chemists. Cavendish Cafe. Film demonstration on a scientific subject, by Mr. Hawtin.

Hull.

January 18.—Hull Chemical and Engineering Society. Municipal Technical College, Park Street. 7.45 p.m. F. S. Pilkington, "The Process of Metal Spraying by the Wire Pistol, and some of its uses."

Leeds.

January 17.—Institute of Chemistry. R. Taylor, "Modern Developments in High Pressure Chemistry."

Liverpool.

January 13.—Institute of Chemistry. Constitutional Club, India Buildings, Water Street. 7.30 p.m. Professor T. P. Hilditch, "Fats, Facts and Figures."

Manchester.

January 10.—Institute of the Plastics Industry (Northern Section). The Engineers' Club, 17 Albert Square. 7.15 p.m. "Design of Injection Moulds."

January 11.—Institute of Fuel. Engineers' Club, 17 Albert Square. 7 p.m. W. C. Whalley, "Internal Combustion Engine Fuels from the Operator's Point of View."

Workington.

January 14.—West Cumberland Society of Chemists and Engineers. Workington Technical College. 7 p.m. E. P. Smith, "The Eternal Problem."

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2 at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Applications for Patents

MANUFACTURE OF LUBRICATING-OILS.—C. Arnold (Standard Oil Development Co.). 34917.

GELATINISATION OF CELLULOSE NITRIC ESTERS, ETC.—Atlas Powder Co. (United States, June 7.) 35485.

RESINOUS COATING COMPOSITIONS, ETC.—Bakelite, Ltd. (United States, Dec. 22, '36.) 35288.

OIL COMPOSITIONS.—Bakelite, Ltd. (United States, Dec. 22, '36.) 35289.

INCORPORATION OF CELLULOSE ETHERS IN RUBBER.—M. Bandli. (Aug. 13.) 35121.

LIQUID ADHESIVES.—B. B. Chemical Co., Ltd. (United States, Dec. 28, '36.) 34940.

ALKALI-RESISTANT COATING COMPOSITIONS.—Beck, Koller and Co. (England), Ltd. (Germany, Dec. 17, '36.) 34893.

MANUFACTURE OF HYDROGEN PEROXIDE.—E. Berl. 35514, 35516.

MANUFACTURE OF LIQUID FUELS.—E. Berl. 35515.

MANUFACTURE OF CARBON ELECTRODES.—E. Berl. 35517.

MANUFACTURE OF PEROXIDES.—E. Berl. 35518.

MANUFACTURE OF DYESTUFFS of the anthraquinone series.—A. G. Bloxam (Soc. of Chemical Industry in Basle.) 35500.

MANUFACTURE OF STEEL.—H. A. Brassert, and H. A. Brassert and Co., Ltd. 35402.

CONCENTRATION OF AQUEOUS ORGANIC ACIDS.—British Celanese, Ltd. (United States, Dec. 22, '36.) 34856; (United States, Dec. 29, '36.) 35225.

TREATMENT OF CELLULOSIC FABRICS.—British Celanese, Ltd. (United States, Dec. 30, '36.) 35226.

ADHESIVES.—British Industrial Plastics, Ltd. 35026.

REFINING OF PARAFFIN WAX.—Burmah Oil Co., Ltd., and C. R. S. Harley. 34912.

MANUFACTURE OF PURE CUPRIC OXYCHLORIDE.—A. Carpmael (I. G. Farbenindustrie.) 35520.

ANTI-CORROSIVE PIGMENTS.—R. S. Carreras. (Hungary, Jan. 15.) 35135.

PREPARATION OF SUBSTANCES having the property of swelling in contact with water.—Cefoil, Ltd. 34982.

MANUFACTURE OF SULPHURIC ACID derivatives of imidazolines. A. Chwala. (Austria, Dec. 18, '36.) 35208.

TREATMENT OF MAGNESIUM, ETC.—Dow Chemical Co. (United States, March 15.) 34897.

ELECTRODEPOSITION OF ZINC.—E. W. Ferm. 34802.

METHOD, ETC., OF DEPOSITING METALS, ETC.—J. Finn, and J. B. Forster. (Australia, Dec. 24, '36.) 35256.

MANUFACTURE OF SYNTHETIC RESIN, ETC.—A. Fischer (Czechoslovakia, Dec. 19, '36.) 34989.

REDUCTION OF METALLIC OXIDES.—H. Gallusser. 34864.

CERAMIC MATERIALS.—General Electric Co., Ltd. 35557.

PRODUCTION OF ACTIVATED GELATIN PREPARATIONS.—Glaxo Laboratories, Ltd., and S. Reynolds. 35234.

MANUFACTURE OF CONDENSATION PRODUCTS from phenolic bodies, etc.—W. W. Groves (I. G Farbenindustrie.) 34868.

MANUFACTURE OF WOOL SUBSTITUTES from viscose.—W. W. Groves (I. G. Farbenindustrie.) 34869.

MANUFACTURE OF DYESTUFFS.—W. W. Groves (I. G. Farbenindustrie.) 35207.

MANUFACTURE OF BODIES of capillary action.—W. W. Groves (I. G. Farbenindustrie.) 35358, 35359, 35360, 35361.

MANUFACTURE OF COMPOUNDS containing quaternary nitrogen. W. W. Groves (I. G. Farbenindustrie.) 35362.

MANUFACTURE OF COLOUR LAKES.—I. G. Farbenindustrie and G. W. Johnson. 34980.

IMPREGNATING, ETC., MATERIALS.—I. G. Farbenindustrie (Germany, Dec. 17, '36.) 35025.

TREATMENT OF CELLULOSE FIBRES.—I. G. Farbenindustrie. (Germany, Jan. 2.) 35366.

MANUFACTURE OF BUTADIENE.—G. W. Johnson. 35276.

MANUFACTURE OF METHYLOL COMPOUNDS.—G. W. Johnson. 35277.

MANUFACTURE OF WAX-LIKE SUBSTANCES.—G. W. Johnson. 35367.

MANUFACTURE OF DYESTUFFS OF PHTHALOCYANINE SERIES.—G. W. Johnson. 35368.

PRODUCTION OF FAST DYEINGS.—G. W. Johnson. 35369.

MANUFACTURE OF RESINOUS SUBSTANCES, ETC.—G. W. Johnson. 35370, 35371.

MANUFACTURE OF ARTIFICIAL RESINS.—G. W. Johnson. 35372.

MANUFACTURE OF FINE METALS, ETC.—Johnson, Matthey, and Co., Ltd., and A. R. Powell. 35273.

MANUFACTURE OF HARD SOLDERS.—Johnson, Matthey, and Co., Ltd. 35274.

METHOD OF VULCANISING SHEETS OF RUBBER.—A. C. Knipe. 35473.

PREVENTION OF CORROSION OF METALS, ETC.—H. Langwell. 35570.

COATING OF ABSORBENT, ETC., MATERIAL.—A. C. Knipe. 35471.

FORMATION OF SYNTHETIC RESIN VENEERS, ETC.—A. S. Lewenstein, and P. Pepperman. 34849.

MANUFACTURE OF LAMINATED MATERIALS.—A. S. Lewenstein. 34850.

CATALYSTS FOR SYNTHESIS OF HYDROCARBONS.—E. B. Maxted. 35153.

PREPARATION OF THIAZOLIUM SALT.—E. Merck, F. Merck, K. Merck, L. Merck, and W. Merck. (Germany, Feb. 22.) 35510, 35511.

PRODUCTION OF STABLE COPPER HYDROXIDE.—New Process Rayon, Inc. (United States, Jan. 26.) 35484.

MANUFACTURE OF CHEMICAL SUBSTANCES.—H. F. Oxley, and E. B. Thomas. 34987.

DEOXIDATION OF STEEL BATHS.—Röchling'sche Eisen-und Stahlwerke Ges. (Germany, Dec. 28, '36.) 35195.

MANUFACTURE OF THERAPEUTICALLY-ACTIVE GOLD COMPOUNDS.—Schering, A.-G. (Germany, Dec. 23, '36.) 35426.

PHOTOGRAPHIC DEVELOPERS, ETC.—Schering, A.-G. (Germany, Dec. 21, '36.) 35430.

MANUFACTURE OF OXO COMPOUNDS of the cyclopentano-polyhydrophenanthrene series.—Schering, A.-G. (Germany, Dec. 22, '36); (Germany, Nov. 26.) 35538, 35539.

HEAT TREATMENT OF SOLID CARBONACEOUS FUELS.—P. M. Schuftan. 35468.

MANUFACTURE OF CALCIUM GLUCONATE.—B. Topley. 35278.

Specifications Open to Public Inspection

PRODUCTION OF SYNTHETIC RESINS and the manufacture of films or sheets therefrom.—Kodak, Ltd. June 18, 1936. 18044/36.

PREPARATION OF SYNTHETIC DERIVATIVES OF LYSERGIC ACID.—Chemical Works, Formerly Sandoz. June 20, 1936. 2091/37.

PROCESS FOR THE PRODUCTION OF SOLUTIONS of the follicle hormone and derivatives thereof.—Chemical Works of G. Richter, Ltd. June 15, 1936. 5325/37.

METHOD OF PRESERVING RUBBER.—Wingfoot Corporation. June 20, 1936. 7653/37.

PROCESS FOR THE PRODUCTION OF YARNS from vegetable fibres which contain adhesive substances.—C. Hofmann Kommanditges. June 15, 1936. 8896/37.

MANUFACTURE OF ORGANIC NITROGEN COMPOUNDS.—Henkel and Cie, Ges. June 16, 1936. 10820/37.

ARYLOXY POLYALKALENE ETHER SULPHONATES.—Rohm and Haas Co. June 20, 1936. 12672/37.

SIMULTANEOUS PRODUCTION OF VINYL-CHLORIDE and polychlorethylenes.—Dr. A. Wacker Ges. Fur Elektrochemische Industrie Ges. June 16, 1936. 14858/37.

PRODUCTION OF ARTIFICIAL MATERIALS from highly polymeric compounds.—I. G. Farbenindustrie. June 16, 1936. 15205/37.

MANUFACTURE OF PYRIMIDINE-THIAZOLIUM COMPOUNDS.—Research Corporation. June 15, 1936. 15270/37.

SURFACE TREATMENT OF METALLIC ARTICLES, particularly aluminium and aluminium alloy articles.—Aluminium Laboratories, Ltd. June 17, 1936. 15735/37.

METHODS OF PURIFYING TITANIUM-SULPHATE SOLUTIONS.—United Color and Pigment Co., Inc. June 16, 1936. 15859/37; 15861/37.

METHOD OF MANUFACTURING FRUIT VINEGAR.—H. Mostny. June 20, 1936. 16326/37.

CHEMICAL MANUFACTURE.—Mathieson Alkali Works. June 17, 1936. 16422/37.

PROCESS FOR THE MANUFACTURE OF THERAPEUTICALLY VALUABLE COMPOUNDS.—Schering-Kahlbaum, A.-G. June 15, 1936. 16618/37.

DYEING AND STRIPPING OF VAT and sulphur dyestuffs.—Chemical Works, Formerly Sandoz. June 15, 1936. 16647/37.

PROCESS FOR EFFECTING THE DEOXIDATION OF COPPER.—Soc. D'Electro-Chimie, D'Electro-Metallurgie, et des Acieres Electriques D'Ugine. June 16, 1936. 16773/37.

METALLOTHERMY, and process for obtaining metals, the oxides or ores of which have a heat of formation inferior to the heat of formation of alumina.—G. A. Favre, and J. Rabbinovitch. June 16, 1936. 16776/37.

PROCESS FOR THE MANUFACTURE OF DYESTUFFS of the anthraquinone series.—Chemical Works, Formerly Sandoz. June 18, 1936. 16787/37.

SOAP PRODUCTS and the manufacture thereof.—Lever Bros., Ltd. June 18, 1936. 16853/37.

MANUFACTURE OF POLYAZO DYESTUFFS.—Soc. of Chemical Industry in Basle. June 17, 1936. 16869/37.

MANUFACTURE OF COMPLEX METAL COMPOUNDS of polyazo dyestuffs.—Soc. of Chemical Industry in Basle. June 17, 1936. (Cognate Application, 16871/37.) 16870/37.

PROCESS FOR THE PRODUCTION OF ALCOHOLS.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. June 17, 1936. 16901/37.

METHOD OF COOLING HYDROCARBON OILS to be refined by the Edeleanu process.—Edeleanu-Ges. June 20, 1936. 16873/37.

PROCESS FOR THE POLYMERISATION OF OLEFINES.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. June 19, 1936. 16902/37.

PROCESS FOR OBTAINING COAL EXTRACTS.—M. Stinnes Gewerkschaft. June 17, 1936. 16923/37.

PROCESS FOR THE PRODUCTION OF SHEET FORMATIONS of a leather-like character from fibres, and polymerisation products of unsaturated organic compounds.—C. Freudenberg Ges. June 20, 1936. 17057/37.

PROCESSES FOR OBTAINING PURE ADDITIVE COMPOUNDS of sulphate of aluminium and of other compounds of aluminium.—S. Bretsznajder. June 18, 1936. 17069/37.

PRODUCTION OF MORDANT DYEINGS on cotton bottomed with oil.—I. G. Farbenindustrie. June 18, 1936. 17067/37.

METHOD OF DESULPHURISING MOTOR FUELS.—M. Stinnes Gewerkschaft. June 19, 1936. 17145/37.

MANUFACTURE OF DEHYDROGENATION PRODUCTS from heterocyclic bases and application thereof.—Soc. of Chemical Industry in Basle. June 20, 1936. 17212/37.

PROCESS OF DYEING MIXED FIBRES.—E. Ruedi. June 20, 1936. (Cognate Application, 17215/37.) 17214/37.

MANUFACTURE OF PHARMACEUTICAL, bactericidal, fungicidal, and like agents.—Deutsche Hydrierwerke, A.-G. June 20, 1936. 17257/37.

MANUFACTURE OF FLEXIBLE ARTICLES from synthetic resins.—E. I. Du Pont de Nemours and Co. June 20, 1936. 17284/37.

IMPROVEMENTS IN ALKALOID SALTS and the manufacture thereof.—J. L. Regnier. April 29, 1935. (Divided out of 9630/36, 9631/36 and 9632/36.) 34581/37.

Specifications Accepted with Date of Application

RECOVERY OF PRECIOUS METALS from solutions.—E. L. Francis (Tube Gold Extractors (Proprietary), Ltd.). Oct. 12, 1936. 476,458.

METHOD OF DEHYDRATING YEAST.—Naamlooze Vennootschap Internationale Suiker en Alcohol Compagnie International Sugar and Alcohol C. Isaco and E. Farber. June 12, 1937. 476,545.

METHOD OF PRODUCING THERAPEUTICALLY and disinfectantly active substances.—Syngala Fabrik Fur Chemisch-Synthetische Und Galenische Arzneimittel Ges., and F. Feigl. May 2, 1936. 476,376.

ANNEALING OF ALLOY STEEL.—W. W. Triggs (Gutehoffnungshutte Oberhausen, A.-G.). March 4, 1936. 476,667.

STABILISED HALOGEN-CONTAINING RUBBER DERIVATIVES.—Marbon Corporation. March 18, 1935. 476,733.

PROCESS FOR THE MANUFACTURE OF IRON, steel and ferrous alloys from pig-iron.—G. W. Willis. April 15, 1936. 476,800.

HARDENING OF PROTEIN MATERIALS.—E. I. du Pont de Nemours and Co., C. Dangelmajeh and E. C. Perkins. June 11, 1936. 476,869.

PRODUCTION OF CELLULOSE DERIVATIVE COATING COMPOSITIONS. E. I. du Pont de Nemours and Co., M. V. Hitt, D. G. Kennedy, and H. Le R. Priddy. June 12, 1936. 476,806.

CHLORINATED RUBBERS.—Rubber Producers Research Association, G. Martin, W. S. Davey, and H. C. Baker. June 15, 1936. 476,743.

ALUMINIUM ALLOY.—T. F. Bradbury. March 16, 1936. 476,930.

APPARATUS FOR THE CONTINUOUS PRODUCTION OF WATER GAS.—A. R. J. Ramsey (N.V., H. Koppers' Industrieele Maatschappij.) June 15, 1936. (Convention date not granted.) 476,879.

TREATMENT WITH HYDROGENATING GASES of distillable carbonaceous materials.—H. E. Potts (International Hydrogenation Patents Co., Ltd.). June 16, 1936. 476,744.

PROCESSES AND APPARATUS FOR THE WASHING and deodorising treatment of noxious fumes.—J. W. Warren, and J. S. Bailey. June 16, 1936. 476,694.

MANUFACTURE OF MOULDING COMPOSITIONS from phenol-aldehyde synthetic resins.—Bakelite, Ltd. June 16, 1936. 476,888.

MANUFACTURE OF ORGANIC ACID AMIDES.—E. I. du Pont de Nemours and Co. July 20, 1935. 476,942.

MASSES OF SOLIDIFIED ALCOHOL and means for preparing same. A. C. S. Micheletti. June 19, 1935. 477,008.

SOLDERING COMPOSITIONS.—J. Barnett. June 19, 1936. (Cognate Application, 12639/37.) 476,697.

PRODUCTION OF ACETYLENE from calcium carbide and water.—I. G. Farbenindustrie. June 22, 1935. 476,952.

MANUFACTURE OF FABRICATED STRUCTURES from copper base alloys.—A. H. Stevens (American Brass Co.). June 20, 1936. 476,854.

MANUFACTURE OF COMPOUNDS of the pregnane series.—A. G. Bloxam (Soc. of Chemical Industry in Basle). June 24, 1936. 476,749.

MANUFACTURE OF ESTERS OF SALICYLIC ACID.—Howards and Sons, Ltd., and W. E. Huggett. June 24, 1936. 476,898.

PRODUCTION OF GAS by dry distillation.—A. Zeuch, and Azett-Gas-Apparatebau Ges. Nov. 4, 1936. 476,909.

VULCANISATION OF RUBBER.—Wingfoot Corporation. July 6, 1936. 476,838.

METHODS OF RETARDING THE DETERIORATION OF RUBBER and rubber composition.—B. F. Goodrich Co. May 27, 1936. 476,712.

MANUFACTURE OF AMINO-ACID DERIVATIVES.—J. R. Geigy, A.-G. Dec. 23, 1935. 476,843.

PRODUCING LUBRICATING-OILS, insulating-oils, and similar viscous oils.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. March 13, 1936. 476,984.

MANUFACTURE OF HETEROCYCLIC COMPOUNDS of high molecular weight.—Soc. of Chemical Industry in Basle. April 29, 1936. 476,988.

SAPONIFICATION OF CELLULOSE ESTERS.—Soc. Rhodiaceta. May 29, 1936. 476,989.

MANUFACTURE AND PRODUCTION OF INTERPOLYMERISATION PRODUCTS.—G. W. Johnson (I. G. Farbenindustrie.) May 21, 1937. (Addition to 466,898.) 476,727.

METHODS OF AND APPARATUS FOR DIFFUSING GASES in liquids.—British Thomson-Houston Co., Ltd. (Allgemeine Elektricitats Ges.). June 12, 1937. 476,857.

RUBBER HYDROCHLORIDE COMPOSITIONS.—W. J. Tennant (Marbon Corporation). March 9, 1936. (Divided out of 476,733.) (Convention date not granted.) 476,795.

METHOD OF PREPARING COLLOIDAL SUSPENSIONS OF GRAPHITE.—R. R. Ducas. Feb. 7, 1936. 476,797.

PREPARING NITRATED DERIVATIVES of hydroformed naphthas and products thereof.—Standard Oil Development Co. Oct. 16, 1935. 477,014, 477,015.

Chemical and Allied Stocks and Shares

CONDITIONS in the industrial and other sections of the Stock Exchange have shown no definite change this week. The amount of business passing was again reported to be very small, but share values generally were fairly well maintained. Sentiment has been influenced by the trend of Wall Street and this probably prevented more active conditions developing.

Boots Pure Drug were a very steady feature around 45s. 6d., which compares with 45s. 3d. a week ago. British Oxygen at 82s. 6d. have lost 1s. 3d. and Murex have been lowered rather sharply to 89s. 4½d. Imperial Chemical lost 6d. to 34s. 9d., but the 7 per cent. preference, in common with the preference shares of most prominent industrial companies, were very firm. In view of the uncertain trend shown by ordinary or equity shares over the past few months, there is a disposition for increased attention to be given to fixed interest bearing stocks and shares. Imperial Smelting at 13s. 3d. are little changed, but a reactionary tendency developed in General Refractories, which have gone back to 19s. 6d. at the time of writing. Nevertheless, the market expects that the dividend on the 10s. shares of the latter company will be above the 16 per cent. paid for the previous year. Triplex Safety Glass were active and fluctuated around 51s. 3d. In this case the market remains hopeful the dividend may be kept at 35 per cent. Last year it was covered by only a moderate margin, but the strength of the balance sheet is generally regarded as permitting a liberal dividend policy. British Match were steady around 35s. 3d., as were British Aluminium at 46s. The market is anticipating an increase in the dividend of the latter company, and the disposition is still to look for 12½ per cent., or 2½ per cent. more than that paid for the previous year.

Distillers were active, but at 106s. are 1s. down on balance. No increase in the forthcoming interim dividend is generally anticipated, as it is the usual custom of the directors to leave all questions of an increase until the final dividend, when the results for the year and the provisions of the Budget are known. Last year the interim was 7½ per cent., and the total payment of 22½ per cent. represented a conservative distribution of profits. United Molasses are virtually unchanged at 25s. 1½d. Lever Bros. ordinary have declined from 36s. 6d. to 25s. 9d., but the various preference issues were firm. The 7 per cent. preference made the rather higher price of 31s. 3d.

Pinchin Johnson are 37s. 9d., compared with 38s. 4½d. a week ago. As it was stated at the last meeting that the directors do not anticipate any difficulty in maintaining the dividend at 20 per cent. on the larger capital arising from the bonus, the market expects this rate will again be forthcoming. The disposition is to assume that both International Paint and Indestructible Paint will also maintain their dividends.

Iron and steel shares were little changed, but had a fairly firm appearance, sentiment being influenced by the official figures as to the record steel output last year and the large sums that are to be expended this year on extensions and improvements to steel works. Textile shares were dull and Courtaulds have gone back from 47s. 3d. to 46s. 6d. Oil shares were lower on balance, but improved following the "Shell" and Royal Dutch interim dividend announcements.

Weekly Prices of British Chemical Products

BUSINESS in the chemical markets during the first week of the new year has been on a small scale, dealers in nearly all sections being occupied with the annual stock-taking. Although actual movements of chemicals into consumption are for the moment restricted there has been a continual flow of inquiries for forward contracts and the outlook is regarded as distinctly promising. The convention quotations for red lead have been reduced by £1 per ton, but there are no other price changes to be recorded for general chemicals, rubber chemicals and wood distillation products, values on the whole being on a firm basis. Trade in coal tar products continues along quiet lines with prices more or less stationary at recent levels. Pyridine and carbolic acid crystals are receiving a fair inquiry although supplies of the latter for immediate delivery are difficult to obtain. Although there has been a fairly long spell of quietness, the tone of the market remains cheerful, and it is confidently expected that more active conditions will prevail in the near future.

Price Changes

Rises: Ammonium Chloride; Arsenic, (Manchester); Salammoniac, fine white crystals; Sodium Acetate; Cresylic Acid, Pale, 99/100% (Manchester).

Falls: Formaldehyde; Lead, red; Naphthalene (Manchester).

MANCHESTER.—The Manchester chemical market has made a quiet start this week after the holidays, and from the point of view of new business slow conditions have been generally reported. Traders state that forward contracts have been placed during the past month or so for quite substantial quantities of both heavy and light materials, although in some quarters it is stated that the volume is somewhat below the level of the previous year. Stocktaking operations are interfering to some extent with deliveries into consumption, but though the outlook in respect of textile chemicals is not so bright as it was a couple of months ago prospects generally are regarded favourably. Price conditions in most sections are on a steady to firm basis.

General Chemicals

ACETONE.—£45 to £47 per ton.

ACETIC ACID.—Tech, 80%, £30 5s. per ton; pure 80%, £32 5s.; tech., 40%, £15 12s. 6d. to £18 12s. 6d.; tech., 60%, £23 10s. to £25 10s. MANCHESTER: 80%, commercial, £30 5s.; tech. glacial, £42 to £46.

ALUM.—Loose lump, £8 7s. 6d. per ton d/d; GLASGOW: Ground, £10 7s. 6d. per ton; lump, £9 17s. 6d.

ALUMINIUM SULPHATE.—£7 2s. 6d. per ton d/d Lancs. GLASGOW: £7 to £8 ex store.

AMMONIA, ANHYDROUS.—Spot, 1s. to 1s. 1d. per lb. d/d in cylinders. SCOTLAND: 10½d. to 1s. 0½d., containers extra and returnable.

AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb., d/d.

AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks.

AMMONIUM CHLORIDE.—Grey galvanising, £19 per ton, ex wharf.

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)

AMMONIUM DICHROMATE.—8½d. per lb. d/d U.K.

ANTIMONY OXIDE.—£68 per ton.

ARSENIC.—Continental material £11 per ton c.i.f., U.K. ports; Cornish White, £12 5s. to £12 10s. per ton f.o.r., mines, according to quantity. MANCHESTER: White powdered Cornish, £17 per ton, ex store.

BARIUM CHLORIDE.—£11 10s. to £12 10s. per ton in casks ex store. GLASGOW: £11 10s. per ton.

BLEACHING POWDER.—Spot, 35/37%, £8 15s. per ton in casks, special terms for contracts. SCOTLAND: £9 per ton net ex store.

BORAX COMMERCIAL.—Granulated, £16 per ton; crystal, £17; powdered, £17 10s.; extra finely powdered, £18 10s., packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Granulated, £16, crystal, £17; powdered, £17 10s. per ton in 1-cwt. bags, carriage paid.

BORIC ACID.—Commercial granulated, £28 10s. per ton; crystal, £29 10s.; powdered, £30 10s.; extra finely powdered, £32 10s. in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Crystals, £29 10s.; powdered, £30 10s. 1-cwt. bags in 1-ton lots.

CALCIUM BISULPHITE.—£6 10s. per ton f.o.r. London.

CHARCOAL, LUMP.—£6 to £6 10s. per ton, ex wharf. Granulated, £7 to £9 per ton according to grade and locality.

CHROMETAN.—Crystals, 2½d. per lb.; liquor, £19 10s. per ton d/d. station in drums. GLASGOW: 70/75% solid, £5 15s. per ton net ex store.

CHROMIC ACID.—9½d. per lb., less 2½%; d/d U.K.

CHROMIUM OXIDE.—11d. per lb.; d/d U.K.

CITRIC ACID.—1s. 0½d. per lb. MANCHESTER: 1s. 0½d. SCOTLAND: B.P. crystals, 1s. 0½d. per lb.; less 5%, ex store.

COPPER SULPHATE.—£21 7s. 6d. per ton, less 2% in casks. MANCHESTER: £18 10s. to £18 15s. per ton f.o.b. SCOTLAND: £20 per ton, less 5%, Liverpool, in casks.

CREAM OF TARTAR.—100%, 92s. per cwt., less 2½%. GLASGOW: 99%, £4 12s. per cwt. in 5-cwt. casks.

FORMALDEHYDE.—£20-£22 per ton.

FORMIC ACID.—85%, in carboys, ton lots, £42 to £47 per ton.

GLYCERINE.—Chemically pure, double distilled, 1.260 s.g., in tins, £4 17s. 6d. to £5 17s. 6d. per cwt. according to quantity; in drums, £4 10s. 6d. to £5 3s. 6d.

HYDROCHLORIC ACID.—Spot, 5s. to 7s. 6d. carboy d/d according to purity, strength and locality.

IODINE.—Resublimed B.P., 6s. 4d. per lb. in 7 lb. lots.

LACTIC ACID.—(Not less than ton lots) Dark, 50% by volume, £21 10s.; by weight, £27 10s.; Pale, 50% by volume, £27; by weight, £32 per ton. LANCASHIRE: Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50%, by vol., £41. One-ton lots ex works, barrels free.

LEAD ACETATE.—LONDON: White, £31 10s. ton lots; brown, £35. GLASGOW: White crystals, £31 10s.; brown, £1 per ton less. MANCHESTER: White, £36; brown, £35.

LEAD NITRATE.—£34 per ton for 1-ton lots.

LEAD, RED.—£31 15s. 0d. 10 cwt. to 1 ton, less 2½% carriage paid. SCOTLAND: £32 per ton, less 2½% carriage paid for 2-ton lots.

LITHARGE.—SCOTLAND: Ground, £32 per ton, less 2½%. carriage paid for 2-ton lots.

MAGNESITE.—SCOTLAND: Ground calcined, £9 per ton, ex store.

MAGNESIUM CHLORIDE.—SCOTLAND: £7 10s. per ton.

MAGNESIUM SULPHATE.—Commercial, £5 10s. per ton, ex wharf.

MERCURY.—Ammoniated B.P. (white precip.), lump, 5s. 11d per lb.; powder B.P., 6s. 1d.; bichloride B.P. (corros. sub.) 5s. 2d.; powder B.P. 4s. 10d.; chloride B.P. (calomel), 5s. 11d.; red oxide cryst. (red precip.), 7s.; levig. 6s. 6d.; yellow oxide B.P. 6s. 4d.; persulphate white B.P.C., 6s. 1d.; sulphide black (hyd. sulph. cum sulph. 50%), 6s. For quantities under 112 lb., 1d. extra; under 28 lb., 5d. extra.

METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

NITRIC ACID.—Spot, £17 to £30 per ton according to strength and destination.

OXALIC ACID.—£48 15s. to £57 10s. per ton, according to packages and position. GLASGOW: £2 9s. per cwt. in casks. MANCHESTER: £49 to £54 per ton ex store.

PARAFFIN WAX.—SCOTLAND: 3¾d. per lb.

POTASH CAUSTIC.—Solid, £35 5s. to £36 15s. per ton for 2-ton lots ex store; broken, £42 per ton. MANCHESTER: £39.

POTASSIUM CHLORATE.—£36 7s. 6d. per ton. GLASGOW: 4¼d. per lb. MANCHESTER: £37 10s. per ton.

POTASSIUM DICHROMATE.—5½d. per lb. carriage paid. SCOTLAND: 5¼d. per lb., net, carriage paid.

POTASSIUM IODIDE.—B.P. 5s. 6d per lb. in 7 lb. lots.

POTASSIUM NITRATE.—Small granular crystals, £24 to £27 per ton ex store, according to quantity. GLASGOW: Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 9¾d. per lb. SCOTLAND: B.P. Crystals, 9¾d. MANCHESTER: B.P. 10¾d. to 1s.

POTASSIUM PRUSSIATE.—6½d. per lb. SCOTLAND: 7d. net, in casks, ex store. MANCHESTER: Yellow, 6½d.

SALAMMONIAC.—Dog-tooth crystals, £36 per ton, fine white crystals, £18 per ton, in casks, ex store. GLASGOW: Large crystals, in casks, £37 10s.

SALT CAKE.—Unground, spot, £3 to £3 10s. per ton.

SODA ASH.—58% spot, £5 17s. 6d. per ton f.o.r. in bags.

SODA, CAUSTIC.—Solid, 76/77° spot, £12 10s. per ton d/d station. SCOTLAND: Powdered 98/99%, £18 10s. in drums, £19 5s. in casks, Solid 76/77° £15 12s. 6d. in drums; 70/73%, £15 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts, 10s. per ton less.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—£19-£20 per ton carriage paid North. GLASGOW: £17 15s. per ton net ex store.
SODIUM BICARBONATE.—Refined spot, £10 10s. per ton d/d station in bags. GLASGOW: £13 5s. per ton in 1 cwt. kegs, £11 5s. per ton in 2-cwt. bags. MANCHESTER: £10 10s.
SODIUM BISULPHITE POWDER.—60/62%, £20 per ton d/d 1 cwt. iron drums for home trade.
SODIUM CARBONATE MONOHYDRATE.—£15 5s. per ton d/d in minimum ton lots in 2 cwt. free bags
SODIUM CHLORATE.—£27 10s. to £32 per ton. GLASGOW: £1 11s. per cwt., minimum 3 cwt. lots.
SODIUM CHROMATE.—4¼d. per lb. d/d U.K.
SODIUM DICHROMATE.—Crystals cake and powder 4¼d. per lb. net d/d U.K. with rebates for contracts. MANCHESTER: 4d. per lb. GLASGOW: 4¼d. net, carriage paid.
SODIUM HYPOSULPHITE.—Pea crystals, £14 10s. per ton for 2-ton lots; commercial, £11 5s. per ton. MANCHESTER: Commercial, £11; photographic, £15 10s.
SODIUM METASILICATE.—£14 5s. per ton, d/d U.K. in cwt. bags.
SODIUM NITRATE.—Refined, £8 per ton for 6-ton lots d/d. GLASGOW: £1 12s. 0d. per cwt. in 1-cwt. kegs, net, ex store.
SODIUM NITRITE.—£18 5s. per ton for ton lots.
SODIUM PERBORATE.—10%, 9¼d. per lb. d/d in 1-cwt. drums.
SODIUM PHOSPHATE.—Di-sodium, £12 per ton delivered for ton lots. Tri-sodium, £15 to £16 per ton delivered per ton lots.
SODIUM PRUSSIATE.—d. per lb. for ton lots. GLASGOW: 5d. to 5¾d. ex store. MANCHESTER: 4¼d. to 5d.
SODIUM SILICATE.—£9 10s. per ton.
SODIUM SULPHATE (GLAUBER SALTS).—£3 per ton d/d.
SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 to £3 10s. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 12s. 6d.
SODIUM SULPHIDE.—Solid 60/62%, Spot, £11 5s. per ton d/d in drums; crystals 30/32%, £8 15s. per ton d/d in casks. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8 10s.
SODIUM SULPHITE.—Pea crystals, spot, £13 10s. per ton d/d station in kegs.
SULPHUR PRECIP.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.
SULPHURIC ACID.—168° Tw., £4 11s. to £5 1s. per ton; 140° Tw., arsenic-free, £3 to £3 10s.; 140° Tw., arsenious, £2 10s.
TARTARIC ACID.—1s. 1¼d. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. MANCHESTER: 1s. 1½d. per lb. GLASGOW: 1s. 1d. per lb., 5%, ex store.
WHITE SUGAR OF LEAD.—£31 10s. per ton net.
ZINC SULPHATE.—Tech., £12 10s. f.o.r., in 2 cwt. bags.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 7d. to 1s. 2d. per lb., according to quality. Crimson, 1s. 6d. to 1s. 7½d. per lb.
ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.
BARYTES.—£6 to £6 10s. per ton, according to quality.
CADMIUM SULPHIDE.—7s. 3d. to 7s. 6d. per lb.
CARBON BLACK.—4¾d. per lb., ex store.
CARBON DISULPHIDE.—£31 to £33 per ton, according to quantity, drums extra.
CARBON TETRACHLORIDE.—£41 to £46 per ton, according to quantity, drums extra.
CHROMIUM OXIDE.—Green, 10½d. to 11d. per lb.
DIPHENYLGUANIDINE.—2s. 2d. per lb.
INDIA-RUBBER SUBSTITUTES.—White, 4¾d. to 5¼d. per lb.; dark 4d. to 4½d. per lb.
LAMP BLACK.—£28 to £30 per ton del., according to quantity. Vegetable black, £35 per ton upwards.
LEAD HYPOSULPHITE.—9d. per lb.
LITHOPONE.—30%, £16 10s. to £17 5s. per ton.
SULPHUR.—£9 to £9 5s. per ton. SULPHUR PRECIP. B.P., £55 to £60 per ton. SULPHUR PRECIP. COMM., £50 to £55 per ton.
SULPHUR CHLORIDE.—5d. to 7d. per lb., according to quantity.
VERMILION.—Pale, or deep, 5s. per lb., 1-cwt. lots.
ZINC SULPHIDE.—£58 to £60 per ton in casks ex store, smaller quantities up to 1s. per lb.

Nitrogen Fertilisers

AMMONIUM SULPHATE.—The following prices have been announced for neutral quality basis 20.6% nitrogen, in 6-ton lots delivered farmer's nearest station up to June 30, 1938: November, £7 8s.; December, £7 9s. 6d.; January, 1938, £7 11s.; February, £7 12s. 6d.; March/June, £7 14s.
CALCIUM CYANAMIDE.—The following prices are for delivery in 5-ton lots, carriage paid to any railway station in Great Britain up to June 30, 1938: November, £7 10s.; December, £7 11s. 3d.; January, 1938, £7 12s. 6d.; February, £7 13s. 9d.; March, £7 15s.; April/June, £7 16s. 3d.
NITRO CHALK.—£7 10s. 6d. per ton up to June 30, 1938.
SODIUM NITRATE.—£8 per ton for delivery up to June 30, 1938.
CONCENTRATED COMPLETE FERTILISERS.—£11 4s. to £11 13s. per ton in 6-ton lots to farmer's nearest station.
AMMONIUM PHOSPHATE FERTILISERS.—£10 19s. 6d. to £14 16s. 6d. per ton in 6-ton lots to farmer's nearest station.

Coal Tar Products

BENZOL.—At works, crude, 9½d. to 10d. per gal.; standard motor, 1s. 3d. to 1s. 3½d.; 90%, 1s. 4d. to 1s. 4½d.; pure, 1s. 8d. to 1s 8½d. GLASGOW: Crude, 10d. to 10½d. per gal.; motor, 1s. 4d. to 1s. 4½d.
CARBOLIC ACID.—Crystals, 7¾d. to 9d. per lb., small quantities would be dearer; Crude, 60's, 4s. to 4s. 3d., dehydrated, 4s. 6d. to 4s. 9d. per gal. MANCHESTER: Crystals, 9½d. per lb. f.o.b. in drums; crude, 4s. per gal. GLASGOW: Crude, 60's, 4s. 3d. to 4s. 6d. per gal.; distilled, 60's.
CREOSOTE.—Home trade, 6¼d. to 6¾d. per gal., f.o.r. makers' works; exports, 6¾d. to 6¾d. per gal., according to grade. MANCHESTER: 5¼d. to 6¼d. GLASGOW: B.S.I. Specification, 6d. to 6¼d. per gal.; washed oil, 5d. to 5¼d.; lower sp. gr. oils, 5¾d. to 6¼d.
CRESYLIC ACID.—97/99%, 4s. to 4s. 3d.; 99/100%, 4s. 6d. to 5s. 6d. per gal., according to specification; Pale, 99/100%, 4s. 4d. to 4s. 7d.; Dark, 95%, 3s. 8d. to 3s. 11d. per gal. GLASGOW: Pale, 99/100%, 5s. to 5s. 6d. per gal.; pale, 97/99%, 4s. 6d. to 4s. 10d., dark, 97/99%, 4s. 3d. to 4s. 6d.; high boiling acids, 2s. to 2s. 6d. American specification, 4s. 3d. to 4s. 6d. MANCHESTER: Pale, 99/100%, 4s. to 4s. 3d.
NAPHTHA.—Solvent, 90/160, 1s. 6½d. to 1s. 7½d. per gal.; solvent, 95/160%, 1s. 7d. to 1s. 8d., naked at works; heavy 90/190%, 1s. 1½d. to 1s. 3d. per gal., naked at works, according to quantity. GLASGOW: Crude, 6½d. to 7½d. per gal.; 90%, 160, 1s. 5d. to 1s. 6d., 90%, 190, 1s. 1d. to 1s. 3d.
NAPHTHALENE.—Crude, whizzed or hot pressed, £7 10s. to £8 10s. per ton; purified crystals, £18 per ton in 2-cwt. bags. LONDON: Fire lighter quality, £5 10s. to £7 per ton. GLASGOW: Fire lighter, crude, £6 to £7 per ton (bags free). MANCHESTER: Refined, £17 10s. per ton f.o.b.
PITCH.—Medium, soft, 36s. to 38s. per ton, f.o.b. MANCHESTER: 33s. f.o.b., East Coast. GLASGOW: f.o.b. Glasgow, 35s. to 37s. per ton; in bulk for home trade, 35s.
PYRIDINE.—90/140%, 12s. to 14s. 9d. per gal.; 90/160%, 11s. to 12s. 6d. per gal.; 90/180%, 3s. 3d. to 3s. 6d. per gal. f.o.b. GLASGOW: 90% 140, 10s. to 12s. per gal.; 90% 160, 9s. to 10s.; 90% 180, 2s. 6d. to 3s. MANCHESTER: 12s. 6d. to 14s. per gal.
TOLUOL.—90%, 1s. 10½d. per gal.; pure, 2s. 3½d. to 2s. 4½d. GLASGOW: 90% 120, 1s. 10d. to 2s. 1d. per gal.
XYLOL.—Commercial, 2s. 2½d. per gal.; pure, 2s. 4½d. GLASGOW: Commercial, 2s. to 2s. 1d. per gal.

Wood Distillation Products

CALCIUM ACETATE.—Brown, £7 15s. to £8 5s. per ton; grey, £10 to £11. Liquor, brown, 30° Tw., 6d. to 8d. per gal. MANCHESTER: Brown, £9 10s.; grey, £11 10s.
METHYL ACETONE.—40-50%, £40 to £42 per ton.
WOOD CREOSOTE.—Unrefined 6d. to 9d. per gal., according to boiling range.
WOOD NAPHTHA, MISCIBLE.—2s. 8d. to 3s. 3d. per gal.; solvent, 3s. 6d. to 3s. 9d. per gal.
WOOD TAR.—£2 to £8 per ton, according to quality.

Intermediates and Dyes

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZIDINE, HCl.—2s. 5d. per lb., 100% as base, in casks.
BENZOIC ACID, 1914 B.P. (ex toluol).—1s. 9½d. per lb. d/d buyer's works.
m-CRESOL 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.
o-CRESOL 30/31° C.—6½d. to 7½d. per lb. in 1-ton lots.
p-CRESOL, 34-5° C.—1s. 7d. to 1s. 8d. per lb. in ton lots.
DICHLORANILINE.—1s. 11½d. to 2s. 3d. per lb.
DIMETHYLANILINE.—Spot, 1s. 6d. per lb., package extra.
DINITROBENZENE.—7½d. per lb.
DINITROCHLORBENZENE, SOLID.—£72 per ton.
DINITROTOLUENE.—48/50° C., 8½d. per lb.; 66/68° C., 10d.
DIPHENYLAMINE.—Spot, 2s. per lb., d/d buyer's works
GAMMA ACID.—Spot, 4s. per lb. 100% d/d buyer's works.
H ACID.—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.
NAPHTHIONIC ACID.—1s. 8d. per lb
α-NAPHTHOL.—Spot, 2s. 4d. per lb., d/d buyer's works.
β-NAPHTHOL.—9½d. to 9¾d. per lb.; flake, 9½d. to 9¾d.
α-NAPHTHYLAMINE.—Lumps, 1s. per lb.; ground, 1s. 0½d. in casks.
β-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb., d/d buyer's works.
NEVILLE AND WINTHER'S ACID.—Spot, 3s. per lb. 100%.
o-NITRANILINE.—3s. 11d. per lb.
m-NITRANILINE.—Spot, 2s. 7d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 8d. to 2s. 1d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 4½d. to 5d. per lb., in 90-gal. drums, drums extra. 1-ton lots d/d buyer's works.
NITRONAPHTHALENE.—9½d. to 10d. per lb.; P.G., 1s. 0½d. per lb.
SODIUM NAPHTHIONATE.—Spot, 1s. 9d. per lb., 100% d/d buyer's works.
SULPHANILIC ACID.—Spot, 8d. per lb. 100%, d/d buyer's works.
o-TOLUIDINE.—10½d. per lb., in 8/10-cwt. drums, drums extra.
p-TOLUIDINE.—1s. 10½d. per lb., in casks.
m-XYLIDINE ACETATE.—4s. 3d. per lb., 100%.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Voluntary Liquidation

J. BARRATT AND CO., LTD., chemical manufacturers, Tonge Springs Works, Middleton, near Manchester.—At the statutory meeting of creditors held at Manchester, the statement of affairs disclosed ranking liabilities of £1,565. The net assets were £1,372. The company was registered in 1918, to take over an existing business. The nominal capital was £7,500, of which £6,776 had been issued and was fully paid up. The company traded successfully for a number of years, but recently losses had been incurred. During the year to March, 1937, the turnover increased to £1,915, and there was a net loss of £512. It was estimated that since April 1st of last year there had been a further net loss of £662. Resolutions were passed confirming the voluntary liquidation of the company with Mr. A. Yearsley, I.A., Manchester, as liquidator. A committee was also appointed consisting of Mr. A. T. Eaves, and the representatives of Cleggswood Oil Distillery, Ltd., and Lancashire Chemical and Mineral Co.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

Egypt.—The Egyptian Ministry of Agriculture is calling for tenders, to be presented in Egypt by February 8, for the supply of ground sulphur, zinc phosphide, barium fluosilicate, and carbon bisulphide. (Ref. T.Y. 32281/37.)

South Africa.—H.M. Trade Commissioner at Johannesburg reports that the South African Railways and Harbours Administration is calling for tenders, to be presented in Johannesburg by February 14, 1938, for the supply of two 10,000 and one 20,000 gallon capacity pressed steel tanks. (Ref. T.Y. 32191/37.)

Australia.—A well-established agent at Sydney wishes to obtain the representation, on a purchasing or consignment basis, of United Kingdom manufacturers of pharmaceutical preparations for Australia. (Ref. No. 2.)

British India.—The Director of Contracts, Army Headquarters, Simla, invites tenders for 730 cwts. aluminium, pure, 99 per cent. Forms of tenders obtainable from the Director-General, India Store Department, Belvedere Road, Lambeth, London, S.E.1, at a fee of 5s. Tenders must be cabled direct to the Director of Contracts, A.H.Q., Simla, to reach him not later than January 11.

Company News

The Asiatic Petroleum Co., Ltd., has increased its nominal capital by the addition of £266,240 beyond the registered capital of £31,073,760.

The International Bottle Co., Ltd., has increased its nominal capital by the addition of £48,000 in £1 ordinary shares beyond the registered capital of £12,000.

Consolidated Tin Smelters announce an interim of 3½ per cent., less tax, to be paid on February 9 on non-cumulative preference shares in respect of year ending June 30, 1938, to all shareholders registered January 18.

Dartmoor China Clay Co., in their report for the year ended December 31 last, state that the year was a disappointing one. Net profit was £723; add balance brought in £12,984, making £13,707; less tax £482, leaving £13,225 forward.

Liebig's Extract of Meat Co., Ltd., state that profits slightly lower at £308,700, compared with £310,656, in the year to the end of August, 1937. Expenses (including provision for losses in subsidiaries) fell from £150,707 to £111,267, but tax and N.D.C. take £112,623, against £83,310, leaving net earnings up by £8,170 at £271,009. The dividend on the ordinary capital is raised from 10 per cent. to 11 per cent., leaving the carry-forward a shade higher at £217,435, compared with £216,426.

Books Received

Colorimetric Methods of Analysis. F. D. and C. T. Snell. London: Chapman and Hall, Ltd. Pp. 815. 45s.

Methods of Quantitative Chemical Analysis. M. G. Mellon. New York. Macmillan Co., Ltd. Pp. 456. 15s.

Chemical Analysis of Metals and Alloys. By Edwin Gregory and Walter W. Stevenson. London: Blackie & Son, Ltd. Pp. 375. 15s.

Year Book and Guide of The Rhodesias and Nyasaland. 1937 Edition. S. Rhodesia. The Art Printing Works, Ltd. Pp. 640. 3s.

Official Chemical Appointments. Ninth Edition. London. The Institute of Chemistry of Great Britain and Ireland. Pp. 415. 5s.

The Principles and Practice of Lubrication. By Alfred W. Nash, M.Sc., and A. R. Bowen, Ph.D., B.Sc. London: Chapman and Hall, Ltd. Pp. 345. 18s.

New Companies Registered

Anti-Bi-San, Ltd. 320,625.—The nominal capital has been increased by the addition of £5,000 beyond the registered capital of £55,000. The additional capital is divided into 100,000 ordinary shares of 1s. each.

Clinical Products, Ltd. 334,752.—Private company. Capital £1,000 in 1,000 shares of £1 each. To carry on business as manufacturers of and dealers in chemicals, gases, drugs, medicines, etc. Subscribers: Stephen P. Rety, 19 Charing Cross Road, W.C.2; Derick R. Martin; Stephen Paul Rety. Registered Office: 5-11 Theobalds Road, W.C.1.

Anglamol, Ltd. 335,018.—Private company. Capital £1,000 in 1,000 shares of £1 each. To carry on the business of manufacturers and importers of and wholesale and retail dealers in oils, fats, greases, spirits and chemicals, including particularly all classes of chemical or other addition agents for petroleum products or other oils or spirits, manufacturers of and dealers in leathers and leather goods, etc. Directors: Harvey S. Garlick, 5 College House, South Downs Road, Bowdon, Ches.; Geo. W. Pressell; Richard H. Patch; Kent H. Smith; Kelvin Smith; F. Alex. Nason. Registered office: 6 Booth Street, Manchester.

Lever Brothers, Port Sunlight, Limited. 334,527.—Private company. Nominal capital of £4,000,000 in 4,000,000 shares of £1 each. To acquire the manufacturing and trading business and undertaking carried on at Port Sunlight, Cheshire, and elsewhere by Lever Brothers, Ltd., and certain assets and liabilities of that company in connection therewith and to carry on the business of soap, candle, paper and varnish makers, seed crushers, manufacturers of and dealers in soap and washing materials, tallow, oil, glycerine, oxygen, chemicals, paints, dyes, colours, dynamite and other explosives, cement, fats, and articles of food prepared from fat or otherwise and food for cattle and horses; printers, photographers, builders, carpenters, carriers, distributors of electricity, proprietors of docks, wharves, harbours, piers, warehouses and stores, etc. Subscribers: James Hulton, Lynton, 13 The Avenue, Bickley; John W. Heywood. Registered Office: Port Sunlight, Cheshire.

G. P.'s Suppliers and Research, Ltd. 334,606.—Private company. Capital, £100 in £1 shares. To carry on the business of manufacturing and industrial chemists, druggists, etc. Subscribers: Jacob Lewin, and Howard Piercy, both of 46 Tachbrook Street, S.W.1.

Eagle Chemicals, Ltd. 334,892.—Private company. Capital £500 in 500 shares of £1 each. To carry on the business of manufacturers of and dealers in blackings, inks, stains, dyes, pigments, cellulose, paints, varnishes, etc. Subscribers: E. Hewlett, 85 Derby Road, Stapleford, Notts.; James B. Carter.

Bentham Chemical Co., Ltd. 334,677.—Private company. Capital £5,000 in 5,000 shares of £1 each. To acquire the business of tar distillers heretofore carried on by J. T. Hackett & Co., at Bentham Tar Works, Bentham, Yorks. Directors: Major Jas. H. Crossley, 941 Manchester Road, Huddersfield; Geo. D. Bamforth; Wilfred D. Crossley; and Frank G. Bamforth.

Davison (Chemist), Ltd. 334,755.—Private company. Capital £2,000 in 2,000 shares of £1 each. To adopt an agreement with Mrs. Mary A. Davison and Mrs. Mary B. Davison and to carry on the business of consulting, analytical, agricultural and general chemists, etc. Directors: Mrs. Mary B. Davison, 40 Linden Road, Gosforth, Newcastle-on-Tyne, 3; John Ingleby; Wm. Shield. Registered office: 197/199 High Street, Gosforth, Northumberland.

Holden Vale Manufacturing Co., Ltd. 334,687.—Private company. Capital £200,000 in £1 shares (170,000 preference and 30,000 ordinary). Objects: To adopt three agreements with Bleachers' Association, Ltd., and two with Hercules Powder Company (incorporated under the laws of the State of Delaware, U.S.A.), and to carry on the business of bleachers of cotton linters, dyers, dressers and finishers, chemical manufacturers, printers and manufacturers of and dealers in cotton, linen, silk, worsted, woollen and other goods, proprietors of collieries and other works, etc. Directors: Sir William Clare Lees, Etherow House, Hollingworth, Cheshire; Eric C. Reynolds; Eric C. C. Hunter; Johannes Meynen; Lloyd Kitchel; Petrus W. Meveringh. Registered office: Blackfriars House, Parsonage, Manchester.